THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

Vol. XXXII. No. 804.] LONDON, OCTOBER 8, 1878. [30th Year.] Price 6d.

GAS PURIFICATION
BY
OXIDE OF IRON.

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SPENT OXIDE PURCHASED IN ANY QUANTITY.

GENUINE TORBAY PAINT
And SPECIAL GASOMETER PAINT.
Several Prize Medals. Established over 20 Years.
These Paints are now used in over 200 Country Gas-Works, and by all the London Gas Companies, on Gas-holders, Scrubbers, Purifiers, &c. Also used by the Admiralty, War Office, Railway Companies, Founders, &c. They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations; do not crack, blister, or flake off; will cover tar effectually.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov. 2, 1866.*
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BROOKFIELD GAS APPARATUS WORKS,
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AND MANUFACTURER OF
WOOD GRIDS
FOR
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JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a Prize Medal was awarded at the Great Exhibition of 1851, for "Gas-Retorts and other Objects in Fire-Clay," and they were also awarded at the International Exhibition of 1862, the Prize Medal, for "Gas-Retorts, Fire-Bricks, &c., for Excellence of Quality."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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Jos. Cowen & Co. are the only Manufacturers of Fire-Bricks and Clay Retorts at Blaydon Burn.

JOHN RUSSELL & CO.,
LIMITED,
Established at the commencement of Gas Lighting,
Manufacturers of
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OLD PATENT TUBE-WORKS, WEDNESBURY.

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BELL BARN ROAD, BIRMINGHAM,
Manufacturers of
WET AND DRY GAS-METERS,
Licensees and Manufacturers of
HUNT'S
PATENT COMPENSATING METERS,
STREET-LAMPS, &c., &c.
Established 1830.

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TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
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Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
Sugar, Saltpetre, and all kinds of Pans.
Roofs, Girders, and Bridges, and General Smith's Work.

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ESTIMATES FREE
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ROBUS'S IMPROVED RETORT-SETTINGS guaranteed to carbonise a large amount of coal with a small per cent. of fuel.
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STATION-METERS OF ALL SIZES, with PLANED JOINTS;

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And all kinds of Experimental Gas Apparatus.

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SIZES: ¾ to 12 inches at GLASGOW.
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A LARGE STOCK KEPT, AND PRICES MODERATE.

Freight to London, in the Stream, 10s. per ton from Stockton; 15s. from Glasgow.

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This Company is now in a position to raise **2000 tons per day of REAL OLD SILKSTONE GAS COAL.**

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Prices quoted to any Railway Station, or F.O.B. Hull, Grimsby, Goole, Keadby, Liverpool, and Fleetwood.

Full particulars will be sent on application to above address.

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Effecting a great saving in the cost of discharging Coals from Vessels, Barges, &c. Several of these Cranes, with the necessary power, are now being erected at the Beckton Gas-Works.

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HYDRAULIC RAMS for Lifting and Lowering Purifier Covers.

Sixteen now in course of erection at Beckton, applied to Covers 30 feet square.

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IN SUCCESSFUL OPERATION AT THE NEW WORKS OF THE NEWCASTLE AND GATESHEAD GAS COMPANY.

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WEST'S GAS IMPROVEMENT COMPANY,

LIMITED,

ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

CHARGING AND DRAWING GAS-RETORTS,

And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

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WORKS: COMMERCIAL ROAD, EXETER,

INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

EVERY DESCRIPTION OF GAS APPARATUS.

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NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

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RETORTS and RETORT-HOUSE FITTINGS, CONDENSERS, SCRUBBERS, ENGINES and EXHAUSTERS, PURIFIERS, STATION-METERS, GOVERNORS, VALVES, &c.

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They beg special attention to the excellence and superiority of their WET and DRY METERS, several thousand being now in use by many of the largest Gas Companies in the West of England and South Wales. Warranted to measure correctly, and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured. A guarantee of Five years tendered with each Meter.

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An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.

PATTERN-BOOKS and PRICE LISTS furnished.

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GAS PURIFICATION & CHEMICAL Co., LIMITED,

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JOHN WM. O'NEILL, Managing Director.

THE

STANDARD WASHER AND SCRUBBER.

[KIRKHAM, HULETT, AND CHANDLER'S PATENT.]

Some of the advantages claimed for this Apparatus are as follow:—

The Exposing of a large Amount of Effectually-wetted Surface (which is continually reproduced) to act upon the Gas.
Unerring Regularity in the Distribution of the Liquor.
Saving of Expense in Providing and Exchanging Scrubbing Material—none being required.
Economy of Space, thus enabling the Apparatus to be protected from the Weather.
Economy of First Cost and of Maintenance.
It works without Pressure.
It is particularly adapted for Gas-Works where Sulphate of Ammonia is manufactured.

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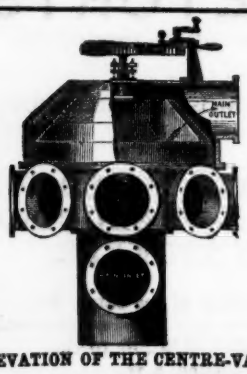
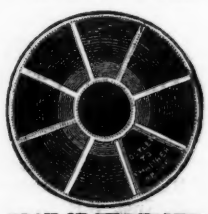
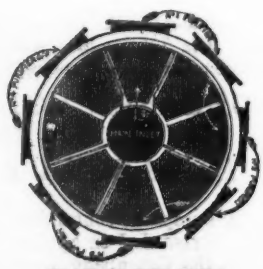
C.! & W. WALKERS'
PATENT CENTRE-VALVES.



ELEVATION OF THE CENTRE-VALVE.



PLAN OF THE VALVE.



PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting-pipes.

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MANUFACTURERS OF ALL DESCRIPTIONS OF

APPARATUS CONNECTED WITH GAS-WORKS.

THE ORIGINAL PATENTEES AND MANUFACTURERS OF THE

DRY-FACED VALVES

FOR PURIFIERS, GASHOLDERS, BYE-PASS, AND OTHER ARRANGEMENTS REQUIRING VALVES IN GAS-WORKS.

The Faced Valves, as made by the Patentees, continue to give great satisfaction, and they are being used extensively by many of the best gas engineers of the day.

They are more easily repaired than any other kind of Valve in use, and can be re-ground in a few hours without removal, and made perfectly gas-tight.

References can be given to many Engineers of high standing, who will testify as to the favour in which they are held.

MANUFACTURERS ALSO OF SUPERIOR WOOD GRIDS FOR PURIFIERS, SCRUBBERS, &c.

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LAMP-METERS IN CAST-IRON BOXES,

And every Description of Gas Apparatus.

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ESTIMATES FOR GAS-WORKS OF ANY SIZE.

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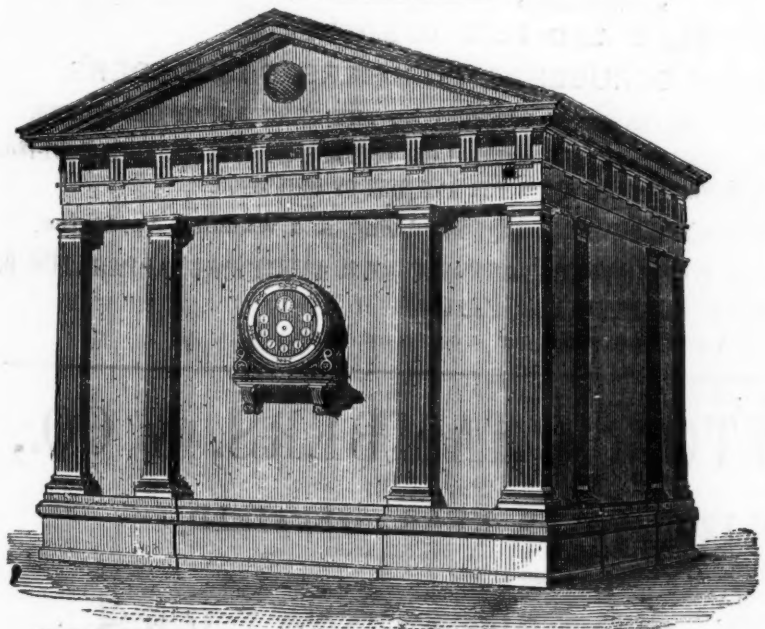
ALSO LICENSEES AND MANUFACTURERS OF

WARNER & COWAN'S PATENT SELF-REGULATING GAS-METERS;

ROUND STATION-METERS,

ON CAST-IRON STANDS.



SQUARE STATION-METERS,

WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, MAIN COCKS, &c.

GAS COOKING APPARATUS.

Home and Foreign Orders promptly attended to.

All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

Orders almost invariably despatched on the day of receipt.

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Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

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ESTABLISHED IN 1860.

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WOOD SIEVES

FOR

GAS PURIFIERS & SCRUBBERS.

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RENOWNED

WOOD SIEVES,

WITH TAPER BARS,

MADE BY MACHINERY

CAPABLE OF MAKING 10,000 FEET WEEKLY.

References to Hundreds of First-Class Engineers.

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JOHN ROMANS, C.E., F.G.S.E.,

CONSULTING GAS ENGINEER

AND

CANNEL COAL FACTOR,

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Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

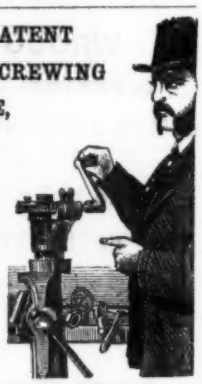
Mr. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

ANALYSIS AND PRICES FORWARDED ON APPLICATION.

GRIRDROD'S PATENT

PORTABLE PIPE SCREWING

MACHINE,



For 1 in., 1¼ in., 1½ in., and 2 in. Gas Threads, complete £7 10s.

In use at the chief gas-works, and giving great a tisfaction.

For other useful goods, see Bailey's "Illustrated Inventions," post free 3s. 6d.; gratis to ledger customers.

W. H. BAILEY & CO.,

Brassfounders, Gauge Injector and Tool Makers,

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RATCHET BRACES, LIFTING-JACKS,

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The following Medals have been awarded:—

GRAND COUNCIL MEDAL, LONDON, 1851. | MEDAL, LONDON, 1862.

GOLD MEDAL, PARIS, 1867,

The only Gold Medal awarded for "Apparatus and Processes for Heating and Lighting" by the Imperial Commissioners

MEDAL FOR PROGRESS, VIENNA, 1873.

MANUFACTURERS OF BRASS AND COPPER SHEETS,

TUBE AND WIRE,

ROLLED METALS, LOCOMOTIVE AND CONDENSER TUBES, CYLINDERS;

Ornamental, Taper, and Cased Tubes;

TIN TUBES;

GAS-FITTINGS, CHANDELIERS,

BRACKETS FOR HEATING AND LIGHTING;

METALLIC BEDSTEADS.

Ecclesiastical and Mediæval Metal Workers.

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REGISTERED TRADE MARK:
R. W. W. & CO.

LONDON OFFICES & SHOW-ROOMS: 141, FLEET STREET, E.C.

W. C. HOLMES & CO.,

WHITESTONE IRON-WORKS, HUDDERSFIELD,

MANUFACTURERS OF

RETORTS, ANNULAR AND PIPE CONDENSERS,

WROUGHT AND CAST IRON SCRUBBERS, PURIFIERS, GASHOLDERS,

GOVERNORS, AND ALL THE NECESSARY FITTINGS FOR COMPLETING THE ERECTION OF GAS-WORKS.

STATION & CONSUMERS WET OR DRY METERS, STREET & SERVICE MAINS, LAMP COLUMNS & BRACKETS, & WROUGHT-IRON TUBES AND FITTINGS; WROUGHT-IRON ROOFS FOR ANY SIZE OF BUILDINGS.

Sole Makers of B. W. Thurston's Combined Condensing, Scrubbing, and Washing Apparatus,

AND PATENTEES OF THE IMPROVED COMBINED CONDENSING AND PURIFYING APPARATUS SO EMINENTLY ADAPTED FOR EXPORTATION.

REFERENCES TO UPWARDS OF 300 GAS-WORKS.

MESSRS. NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD,

MANUFACTURERS OF

IMPROVED CENTRE-VALVES,

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.

TANGYE BROTHERS AND HOLMAN,

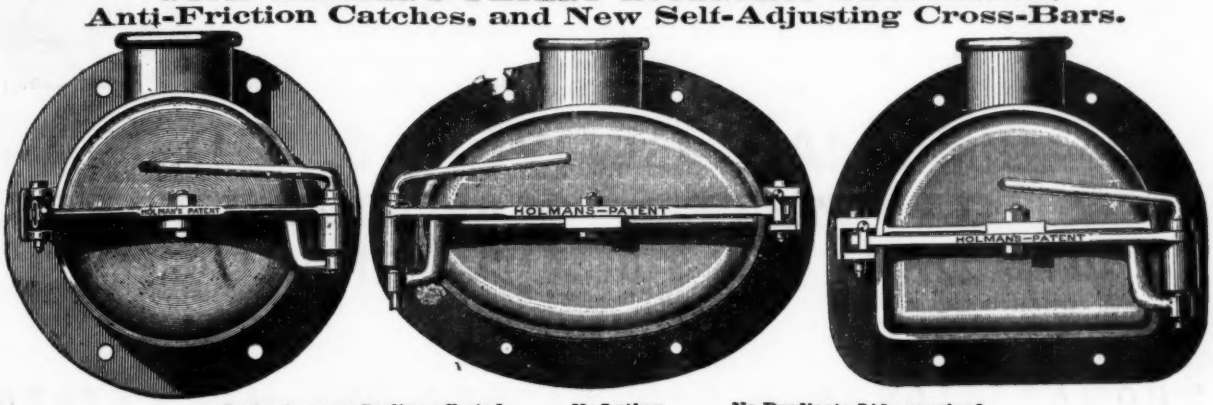
CORNWALL HOUSE, 35, VICTORIA ST., LONDON, E.C.

(LATE OF 10, LAURENCE POUNTNEY LANE.)

SOLE MAKERS OF MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH HOLMAN'S PATENT ECCENTRIC FASTENINGS,

Anti-Friction Catches, and New Self-Adjusting Cross-Bars.



Instantaneous Sealing effected. No Luting. No Duplicate Lids required.

Holman's New Self-Sustaining Cross-Bar ensures freedom of Joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested, being now in use in nearly all the principal Gas-Works in London and the Provinces.

T. B. and H. are now making the "Morton's Self-Sealing Lid" of the SAME FORM OR SECTION AS THE RETORT (see Illustrations above), as well as bringing the Mouthpiece from the D or Oval at back to Circular in front, as heretofore.

D and Oval Morton's Lids are working satisfactorily both in this country, on the Continent, and in the United States of America. Among others they have been adopted by the following Gas-Works:—

The Gaslight Company's Works, Fulham; Ditto, Bromley-by-Bow; Ditto, King's Cross; Ditto, Shoreditch.
And also in the Gas-Works at Richmond, Maidstone, Gloucester, Glasgow, Portsea, Roubaix (France), The Hague (Holland

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

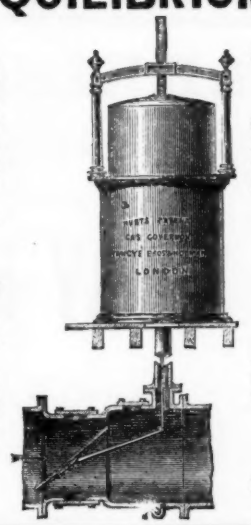
Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at an convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.



These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dursley, Exeter, Guernsey, Halesowen, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1875.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

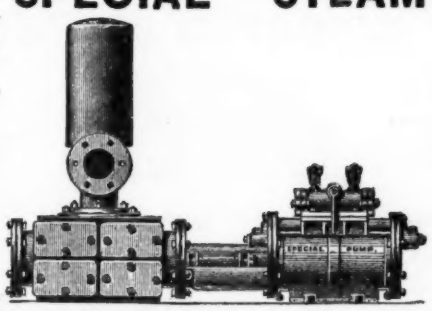
Yours truly,

(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION.

THE "SPECIAL" STEAM-PUMP.

Diameter of Steam Cylinder.	Diameter of Water Cylinder.	Length of Stroke.	Gallons of Water per Hour, Approximate.	Reduced Prices.
3	1½	9	450	£16
4	2	9	815	18
5*	2½	12	1,250*	20
5*	3	12	1,830*	22 10
4	4	12	3,250	25
6*	4	12	3,250*	30
5	5	12	5,070	32 10
7*	5	12	5,070*	40
6	6	12	7,330	40
8*	6	12	7,330*	50
7	7	12	9,750	50
10*	7	12	9,750*	65



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FULL PARTICULARS, ESTIMATES, CATALOGUES, ETC., ON APPLICATION.

London, 1851 | New York, 1853. | Paris, 1855. | London, 1862.

Dublin, 1865. | Paris, 1867.

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PATENT DRY GAS-METERS,

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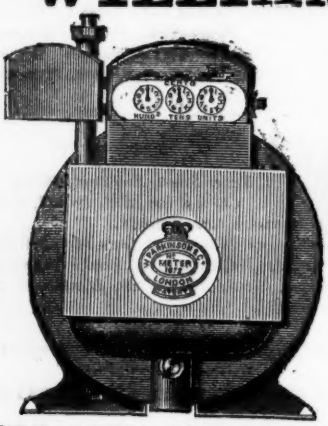
THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON AND CO.,



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MANUFACTURERS OF

WET & DRY METERS,

STATION-METERS & GOVERNORS,

EXHAUSTER REGULATORS,

PRESSURE REGISTERS, EXPERIMENTAL APPARATUS, GAUGES, WATER-METERS, &c.

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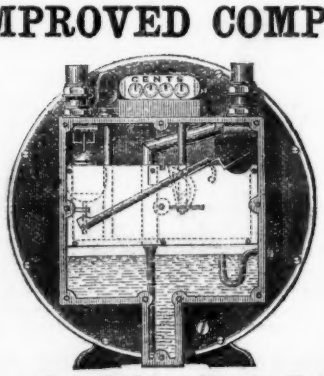
In this Meter, the action of the measuring-drum is reversed. By this arrangement an improvement is effected in the registration at high speeds, which, in many tests, has not varied from the smallest light to three times the capacity of the meter. It works equally well under all pressures. The range of error between the high and low line is much smaller than that allowed by the "Sale of Gas Act."



The Meter has been critically tested, and most favourably reported upon by official Meter Inspectors in London and Birmingham.

W. PARKINSON and CO. have made arrangements for the manufacture of these Meters, both in tin and cast-iron cases, and for the alteration of old ones to this principle, which is confidently recommended as possessing every quality that can be desired by Gas Companies, Corporations, or Private Consumers.

COTTAGE LANE, CITY ROAD, LONDON, E.C.

CONTENTS.

	PAGE
Circular to Gas Companies:—	
The Meetings of Metropolitan Gas Companies	517
The Electric Light	517
The Question of Amalgamation in the Metropolis	517
Half-Yearly Meeting of the Surrey Consumers Gas Company	517
Half-Yearly Meeting of the Commercial Gas Company	517
Half-Yearly Meeting of the Phœnix Gas Company	518
Half-Yearly Meeting of the London Gas Company	518
Half-Yearly Meeting of the Sheffield United Gas Company	518
Half-Yearly Meeting of the Alliance and Dublin Gas Company	518
Annual Meeting of the Shrewsbury Gas Company	518
Gas Accounts of the Salford Corporation	518
Meeting of the North of England Association of Gas Managers	518
Winter Instructions of the Metropolitan Gas Referees	518
Quarterly Report of the Chief Gas Examiner of the Metropolis	518
The Education of the Gas Manager of the Future	518
Mr. Backler on the Electric Light	518
Water and Sanitary Notes:—	
The Metropolitan Board of Works and the London Water Companies	518
The Corporation of London and the Metropolitan Board on Hydrants	519
Report and Accounts of the East London Water Company	519
The Water Supply of Liverpool and the Verniew Scheme	519
Meeting of the Sanitary Congress at Stafford	519
Leading Article:—	
Water Legislation for 1878	519
Correspondence:—	
The Education of the Gas Manager of the Future	520
The Estimation of Sulphur in Coal Gas	521
Liegel's Generator Furnace	521
The Cost of Coal and the Price of Gas	522
Miscellaneous News:—	
Metropolis Gas Supply	522
Metropolis Water Supply	522
Analyses of New Zealand and Australian Coals	522
Meeting of the London Gas Company	523
Meeting of the Alliance and Dublin Consumers Gas Company	525
Meeting of the Phœnix Gas Company	526
Meeting of the Surrey Consumers Gas Company	529
Meeting of the Commercial Gas Company	530
Meeting of the Sheffield United Gas Company	532
Meeting of the Shrewsbury Gas Company	534
Meeting of the South Metropolitan Gas Company	534
East London Water-Works Company	534
State and Progress of Electric Lighting in Paris	534
The Lowe-Strong Water Gas Process	536
Trade Reports	536
Sale of Gas Stock at Fareham	537
New Company Registered	537
Blackpool Gas Supply	537
Water Supply of Limerick	537
Presentation to Mr. W. Fergusson, of Sheffield	537
Accident at the Worksop Gas-Works	537
Birmingham Corporation Water Supply	537
North of England Gas Managers Association	537
Register of New Patents:—	
Thompson, W. P.—Ball or Spherical Valves	537
Johnson, J. H.—Converting Hydrocarbons into Gas	537
Patents which have become void	537

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

A. G. VAN EYNDHOVEN, Haarlem.—*The Summer Instructions of the Metropolitan Gas Referees were superseded by their Winter Instructions from the 30th of September last.*

A COUNTRY SUBSCRIBER.—*It has been decided that they cannot.*

SUB-MANAGER.—*Next week.*

We may again remind our readers that letters arriving later than Saturday cannot, as a rule, be inserted in the next issue.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 8, 1878.

Circular to Gas Companies.

A TEN per cent. dividend naturally makes investors jubilant; but nevertheless the reports of the half-yearly meetings of the Metropolitan Gas Companies, which we publish to-day, show that Directors and Shareholders are not without their anxieties. The blaze of the electric light seems to have somewhat dazed them. They endeavour to conceal fears which should have no existence, and hide doubts which ought never to have arisen. We regret that so many words should have been devoted to the prospects of the electric light, and are much afraid that Shareholders will hardly be reassured by the statements made at the various meetings. It would have been better, we think, to have dismissed the matter, not with silent contempt, but with a few words assuring Shareholders that, in its present state of development, the electric light bodes no ill to Gas Companies. Nay, as it was very properly put at one meeting, it at present offers a good chance of increasing the consumption of gas, mainly in the direction of its use as a heating agent to produce motive force. It is admitted on all hands that electricity can only be utilized as an illuminating agent for the lighting of large spaces, open or closed. But there are difficulties even here, and for ordinary street lighting we regard it at the present moment as utterly inadmissible. When any one reflects that the subtle force can only be sent for short distances, and that power-stations will have to be distributed at frequent intervals, it will be seen that many obstacles stand in the way of even the illumination of thoroughfares.

One thing which strikes us more than any other is the small amount of information which gentlemen who go to Paris to see the light bring home with them. Everybody knows that it is a beautiful light; everybody knows that certain localities and establishments in Paris are magnificently illuminated by it; but nobody seems able to get at the real cost, and the true photometric value. We may be well assured that the latter is high; but still the effects may not be all that would be anticipated. Any one who walks along the Strand, and keeps his eyes open, will probably observe the short distance which the light of the lamps at the Gaiety Theatre travels. In Paris the same thing is remarked. On the Place de l'Opéra the electric lights may be said to be crowded together. Still, on the other side of the way, at the present moment we cannot say how far distant, gas is required to illuminate the pavement, and necessarily the shop windows. So much may be seen in London, the fact being that the southern side of the Strand is but faintly illuminated by the lights of the theatre opposite. We have still, as we have said, to wait for further information as to the present position of the electric light; and then we want the opinions of competent electricians as to the place that it may possibly occupy in the future. All that we now know is that a great light may be generated, the utility of which is undetermined, and the exact value of which, except for a few special purposes, is unknown. Under such circumstances Gas Companies may rest, not exactly contented, but with little apprehension. It may be that within a few days we shall have some further information, for we learn that the light is to be installed at a large manufacturing establishment in the East of London, where careful estimates will be made, with the comparative cost with gas. Of this our readers will in time receive a full account.

It will be observed that at the meeting of only one Metropolitan Company did the question of amalgamation crop up. It is not surprising that it should have been at the Surrey Consumers, for it may be admitted that in the case of this Company amalgamation is most desirable. It is so far satisfactory to learn that an agreement has been made, by virtue of which all the Southern Companies will unite, with the exception of the London; and that afterwards what may be called the head of the confederacy will be the Chartered Company. But great difficulties stand in the way, and although the agreement exists, the action to be taken on it is still doubtful. We feel satisfied that, if Directors will look dispassionately upon the circumstances which now surround Metropolitan Gas Companies, and some which threaten their interests, they would have no hesitation in forming that alliance, which would prove so much to their general advantage. To take up only one point which has been insisted upon—the desirability at the present moment of supplying gas as cheaply as possible. It is quite certain that one united Company could supply London with gas at a much cheaper rate than it is now furnished at by the Company who make the lowest charge. The very great saving which would be effected in establishment charges would neutralize the influence of excessive capitals, and at the same time, the advantage which one enormous Company would have in the coal market, would necessarily reduce the cost of our prime material to an absolute minimum. To the profits which would accrue from the utilization of residuals we shall not here allude. That is a matter which will come up for discussion at some future time. All we may note here is that the time is ripe for amalgamation. At the present moment, the interests of the Metropolitan Gas Companies are not threatened by anything more than the spectre of the electric light. The Metropolitan Board of Works appear to have resigned all hope of getting possession of the undertakings; but with the return to dearer gas, we may be certain that troublous times will again come, inasmuch as it cannot be disputed that some Companies are in a better position than others to withstand the difficulties which may arise from another coal famine. Now, when things are easy and smooth for all, is the time to negotiate.

Coming to the meetings of the individual Companies, we may first notice the Commercial Company, who, under the sliding scale, pay a dividend one-half per cent. in excess of what may still be called the statutory rate, and carry a balance of £1025 to the reserve-fund. This is highly satisfactory, and we feel certain that future balance-sheets of the Company will show still better results. Their new works at Bromley are just now being brought into operation, and the district of the Company is only partially filled up. The electric light is not likely to invade it, and all that is required to increase the prosperity of the Company is cheap gas.

The meeting of the Phœnix Company, of course, passed off

very satisfactorily. The affairs of the Company are at present in a highly prosperous state, and their works are equal to the production of as much gas as will be required by them for years to come. But, perhaps, something is still wanting to ensure the continued prosperity of the Company—shall we say amalgamation? The Phœnix are an amalgamated Company in themselves. Let any one suppose what would be the consequence if the separate works at Vauxhall, Bankside, and Greenwich were managed by three directorates and three clerical staffs. The waste of money would be enormous; but, by a concentration of establishments, the Phœnix Company are very economically managed. Such would be the case, to a vastly greater extent, if all the Companies were united.

The meeting of the London Gaslight Company was enlivened by two admirable speeches—one by Mr. R. Rawlinson, C.B., and the other by Mr. Leng, of Dundee; and we commend these addresses to the perusal of our readers. The main topic of both was, of course, the electric light, and its prospects as a competitor with gas. On this point much sound sense was expressed, which will tend to reassure Shareholders. It is hardly necessary to repeat here that the London Company are in a most satisfactory state, and the investor who parted with his interest in the Company for a phantom might be regarded as imbecile.

The Sheffield United Gaslight Company have had a prosperous half year. They pay full dividends, as a matter of course, and carry £6930 to the reserve-fund. This fund now amounts to £60,857, so it is clear that the Directors were fully justified in making the reductions in price which came into operation on the 1st of July last. The question of the electric light naturally here also cropped up, but nothing new was said respecting it. The Chairman expressed his personal opinion that it would come into extensive use, but he is none the less confident that it will never affect the stability of gas investments.

We have mentioned before that the Alliance and Dublin Company have had a prosperous half year, paying full dividends, and carrying forward a large balance. It will be seen that the Chairman, in his speech, alluding to the electric light, stated that the Company, if the Directors saw any prospect of advantage being derived from such a step, would become the purveyors of the new light. It is a question how far Gas Companies would have the power to undertake such a business without special legislation. Undoubtedly where such power does exist, it should be exercised, if the least chance of good profit were visible; and the Dublin Company have great advantage in possessing the able assistance of Mr. Wigham in deciding when they shall take the step. We are sorry that we have not a report of this gentleman, who is one of the men most competent to form an opinion on the merits, demerits, and prospects of the electric light. It is satisfactory to see the consumption of gas is increasing in Dublin. During the past half year three hundred new customers were added. Nothing is required but cheap gas to procure large additions to this number, and next year we hope to see the Company make still further advance.

The Shrewsbury Gas Company pay their usual dividend of seven and a half per cent., and add £2000 to the reserve-fund. The Directors now propose to make liberal reductions in price. It is quite clear that the scare has not reached Shrewsbury, for not long ago they put up for auction £3500 of stock, which realized, after payment of expenses, £5504. The purchasers of this stock must be contented with small profits.

An abstract of the gas accounts of the Salford Corporation is before us. Owing to the Local Taxation Returns Act, 1877, the statement now presented gives the accounts for only nine months. They are of a highly satisfactory character. The consumption of gas in Salford rapidly increases, and, notwithstanding reductions in price, the profits continue to rise. During the nine months included in these accounts the profit made was £39,465, which has been allocated as follows:—Interest on mortgages, £9285; sinking-fund, £4492; annuities, £1897; appropriated to districts for improvement purposes, £7500; whilst the remainder has been applied to the depreciation or reserve fund. We may remark that the several funds are now in a healthy state, large additions having been made to them within the last two or three years. When we receive the full accounts, we may give a more detailed notice of them.

A very interesting meeting of the North of England Association of Gas Managers was held last Saturday, at Carlisle, under the presidency of Mr. John Hepworth, the Engineer of the Corporation Gas and Water Works of that city. After an able Address from the President, some valuable papers were read. Among them was one to which we may have to call special attention, by Mr. John Pattinson, F.C.S., "On the Relation between "the Sulphur Tests of Wright, Letheby, and the London Gas "Referees." A careful comparison of the value of these three apparatuses for the determination of sulphur has long been a desideratum; and we are glad that Mr. Pattinson has undertaken the task. The other papers were "On Tank Trammels," by Mr. W. Ford, of Stockton-on-Tees; and "On the Advantage "to Gas Companies of Carrying on the Business of Gas-fitters," by Mr. C. Sellers, of York. The social part of the proceedings passed off in an admirable manner.

The Winter Instructions of the Gas Referees have just been issued. There are, of course, the usual alterations in the amounts of "sulphur" allowed, an additional five grains being permitted at all the stations during the winter months. The maximum amount of ammonia allowed, for some years past, has been two and a half grains in the hundred feet; but the Referees now change the maximum to four grains. We hope this will not lead to any laxity in the recovery, as far as possible, of this valuable residual.

An abstract of the quarterly report of Dr. Williamson, F.R.S., the Chief Gas Examiner of the Metropolis, will be found in another column. It shows that the Companies under his supervision well fulfil their obligations. Not a single failure in respect of illuminating power was reported during last quarter; and the excesses of "sulphur" were few and far between. Ammonia is reported as present in but minute quantities, and in the case of one testing-station was entirely absent. Why, then, have the Referees raised the maximum to be allowed?

We publish with pleasure, to-day, some further correspondence on the Education of the Future Gas Manager. Mr. White, we rather think, somewhat misrepresents the views of previous correspondents. The present Manager has not been described in our columns as the "degenerate wretch." On the contrary, his merits have been fully recognized; but there is an opinion abroad that he may be improved, and, along with it, his professional status elevated. We have an idea that something may be done in this direction, with advantage to all parties concerned. The views expressed by the "Stokers" will be thoroughly appreciated. The man who has to act as Manager, Secretary, and Collector, and to fill up his leisure time in main-laying and retort-setting, could hardly be a fine gentleman; but, with all our wish to see the position of Managers improved, we have no desire to see them transformed into such characters. The idea of the "Frugal Stoker" respecting the examination test is excellent. It is just the system which we should like to see brought into operation.

Any reader who wishes to know all that is known respecting the electric light should, if he can procure a copy, peruse a pamphlet issued for private circulation, by Mr. Henry M'Lauchlan Backler, Managing-Director of the European Gas Company. Mr. Backler has collected information from all sources, and, moreover, gives the experience he has acquired in the course of his frequent visits to the Continent. It is a very useful compilation, and we are sorry it is not made more available to our readers.

Water and Sanitary Notes.

The London Water Companies are threatened with another attack from the Metropolitan Board of Works. At their meeting on Friday last, it was resolved to refer it to a Committee, to consider the advisability of preparing a Bill, to present in the next session of Parliament, to enable the Board to acquire the interests of the Companies. We should have thought the experience of last session would have taught the Board the futility, at all events under present circumstances, of all attempts to buy the works. It could never be done without the assistance of Government, and no help to confiscation will be given by the present Ministry. Unless the Board can show some serious defaults on the part of the Companies, and can convince the public that great advantages would be derived from a change of proprietorship, the Board will have to wait until we have a Government with men at its head holding views like those of Mr. Chamberlain and Mr. Cowen, backed by a strong majority holding very similar opinions. Then, in that case, the Board might succeed in their designs; but a strong Conservative Government will never allow property to be wrested from its owners without good reason being shown. There is another thing which should make the Board hold their hands, and moreover attract the attention of the Vestries. Large sums of the ratepayers moneys have for years been squandered in fruitless parliamentary contests. How long is the practice of promoting Bills which have no chance of success to be continued? The Metropolitan ratepayer is a long-suffering animal, but he will presently be made aware of the extent to which he is plundered, and become strong in his remonstrances.

The Gas and Water Committee of the Corporation of the City of London went last Friday to the Board, to ascertain their views respecting the system of hydrants which the Corporation are laying down within the City. What the special object of the interview was we cannot make out from the report before us. The Corporation, we understand, pay for these hydrants, not out of money raised by rates or taxes, but out of what they will have us believe were the private means of the Corporation. Under these circumstances, we do not see that the Metropolitan Board could be asked to contribute towards the cost. The matter has been relegated to the consideration of the Works and General Purposes Committee, and perhaps we shall learn, in time, the opinion of the Board on the subject of the City hydrants. Meanwhile, it is represented that the City is very badly protected from the ravages of possible conflagration.

The report and accounts of the East London Water-Works Company will be found in another column. It is unnecessary to say that the Company make rapid progress. They have taken the lead in introducing a constant service to the Metropolis, and have thereby effected much good. They are rewarded, not in consequence, by large profits, which, after all, are not so high as they ought to be. The Company pay, for the past half year, dividends at the rate of six and four and a half per cent. per annum. The increase of business is enormous, and a continued capital expenditure is required to adapt the works for an adequate supply. Last half year they pumped 4,801,378,588 gallons, being 258 million gallons more than in the same half of 1877. The Directors, in their report, lament the heavy expenses they were put to last session in consequence of the action of the Metropolitan Board of Works. We are sorry to say that in the course of next session they may be exposed to charges just as heavy, and without the smallest justification. They will, however, in our opinion, continue to hold their property for very many years to come, to the great benefit of the population of the East of London. Taken in connection with the reports of Dr. Tidy, Major Bolton, and Dr. Frankland, we may say the Company are now in an admirable position, both financially and as purveyors of some of the best water supplied to the Metropolis.

We are unfortunately obliged to read, in the course of our occupation, a great deal of nonsense; but with the exception of that emitted last year in opposition to the Thirlmere scheme, we have never read worse than that printed against the Verniew scheme of the Liverpool Corporation. The absurdity of supposing that any serious diminution of the volume of the Severn would result from the appropriation of the Verniew must be apparent to every one, and we may express a qualified opinion that the river would be improved by the exclusion of heavy rainfalls at certain seasons of the year. We do not care very much about the Severn as a salmon river, and we confess to ignorance as to how far the salmon go up to spawn. One thought dominates us. An immense population in Liverpool will, in the course of a few years, be thirsting for water. They will not be able to afford salmon, but they must have water, and the Corporation are bound to provide it for them. Whether or not the best source has been fixed upon we shall not undertake to say, but Liverpool must have water, and Alderman Bennett's well scheme failing, they must go to a distance to obtain it. We put out of consideration the wants of, and the benefits which may be conferred upon, the inhabitants of towns and villages lying along the line of sixty-six miles of aqueduct which will convey water from the catchment reservoir to Liverpool. There is no doubt that great benefits may be conferred on these by a distribution of the water.

The Sanitary Congress has had a very successful meeting at Stafford. It was opened with a characteristic address by Mr. Edwin Chadwick, C.B., in which he reproduced all his time-worn notions on sanitary matters. He still believes that all that is necessary to make English people healthy, wealthy, and wise, is a sufficient number of Inspectors to restrain the infringement of sanitary laws. We lament, as much as any one can, the enormous loss of infantile life, and regret the evils which result from the sickness of adults. Mr. Chadwick gave a remarkably clear account of the conditions of life in Staffordshire thirty years ago, and those which obtain to-day, and frankly admitted that whatever had been done in the meantime, in the way of sanitary improvement, has had but little effect on the mortality of the country. The reason, of course, given was that the inspection had not been efficient. He calculates that the saving that would accrue from the preservation of life would amply compensate for any outlay for sanitary works and inspection. Supposing that his system had been introduced twenty years ago, and had been followed by all the results he anticipates, what would now be the condition of Staffordshire? With the present population, work is scarce and wages are low; if we had some thousands more mouths to fill and hands to employ, what would be the consequence? The price of food would necessarily rise, and the competition for employment would certainly bring down the rate of wages. Thus poverty would naturally result, and poverty means disease, and so we work round in a circle. Put poor people, insufficiently fed and badly clothed, into a palace furnished with every sanitary appliance, and the so-called preventible diseases would inevitably break out. Nothing is meant here in deprecation of the work of sanitation; all we wish to do is to discourage the exaggerated notions of the results to be expected from sanitary work. Apart from this, we may just mention that in this country checks on the increase of population are absolutely necessary. Nature is doing the work her own way, and it is a question how far we should interfere with her operations. Some valuable papers were read at the meeting, which we shall, in course of time, present to our readers.

WATER LEGISLATION FOR 1878.

THE Acts relating to water undertakings passed in the last session will be found in abstract below. The only one conferring statutory powers upon a Company hitherto without such authority is—

The *Sevenoaks Water-Works Act*, which incorporates the Sevenoaks Water-Works Company, embodied in 1864 under the Companies Clauses Act, 1863. The original capital of the Company was £12,000, and they have borrowed on mortgage debentures £2500. By this Act they obtain power to raise £12,000 additional capital, carrying the usual borrowing powers. The dividends upon this additional capital are seven and six per cent., according as it is issued as ordinary or preference. Our readers know that there has been a good deal of agitation about water affairs in Sevenoaks, which has probably been, so far, quieted by this Act, inasmuch as the Company obtain power to dispose of their undertaking to the Local Board. We have not as yet any knowledge as to whether the Local Board will avail themselves of this opportunity. Power is given to the Company to make ordinary charges for a domestic supply, with the usual extras for closets and baths.

The Acts conferring further powers upon Companies are as under:—

The *Cardiff Water-Works Act* is to empower the Cardiff Water-Works Company to construct additional works, and raise further capital. The present share capital of the Company is £71,490, with loans to the amount of £12,550. By this Act the Company acquire power to raise additional capital to the amount of £200,000, carrying borrowing powers to the usual extent. As the undertaking will in all probability pass very shortly into the hands of the Corporation of Cardiff, we need make no further allusion to the provisions of this Act.

The *Deal Water Act* is to confer further powers on, and to authorize the Deal Water-Works Company to raise additional capital. The present authorized capital of the Company is £7000, with borrowing powers to the extent of £2300. This Act empowers the Company to raise share capital or stock to the amount of £10,000, carrying the usual borrowing powers. There is nothing else in the Act which requires notice.

The *Grand Junction Water Act* is to empower the Company to raise further capital to the amount of £300,000, and to borrow accordingly; and to amend certain provisions of previous Acts.

The *Nottingham Water Act* extends the limits of the Nottingham Water-Works Company, and authorizes them to raise additional capital to the amount of £100,000, carrying the usual borrowing powers.

The *Scarborough Water Act* is to extend the limits of supply of the Scarborough Water-Works Company, and empower them to construct new works and raise additional capital. By this Act the Company obtain power to raise further capital to the extent of £80,000, carrying the usual borrowing powers. The Company are by this Act authorized to acquire the undertaking of the Scalby Water Company, Limited. The undertaking of the Scarborough Water-Works Company is practically sold to the Corporation of that borough.

The *South Hants Water Act* is to extend the limits of the South Hants Water-Works Company, and empower them to raise further capital. Their present authorized capital is £50,000, with the usual borrowing powers. By this Act they obtain power to raise additional capital to the amount of £30,000, carrying the usual borrowing powers. The supply is to be constant, at the charges fixed by their previous Act of 1876.

The *Southport Water-Works Act* is to empower the Southport

Water-Works Company to construct additional works, extend their limits of supply, and raise further capital. The present share capital of the Company is £150,000, carrying borrowing powers to the usual extent, the whole of which money has been raised and expended. By this Act they are authorized to raise additional capital to the amount of £150,000, with the usual borrowing powers. The new supply is to be obtained from a well or wells in the parish of Aughton.

The *South Staffordshire Water-Works Act* is to confer further powers on the South Staffordshire Water-Works Company. Their present authorized capital is £600,000, of which £478,024 has been paid up. By this Act the Company acquire power to raise additional capital to the amount of £150,000, carrying the usual borrowing powers. The Act authorizes the construction of some additional works to meet the growing wants of their extensive district.

The *Trowbridge Water Act* is to extend the limits of the Trowbridge Water Company, and enable them to raise further capital The additional capital authorized to be raised by this Act is £30,000, and the Company are required to supply the Sanitary Authority of Melksham with water in bulk at the rate of sixpence per thousand gallons. It is further provided that, on a notice being given by the Sanitary Authority of Melksham to the Company, the latter shall sell their plant by agreement or on arbitration, and thereafter cease to supply within the township, except so far as they sell in bulk to the Sanitary Authority.

The *Truro Water (Extension of Time) Act* is, as the title indicates, simply intended to give the Truro Water Company an extension of two years for the completion of the works authorized by their Act of 1875.

The *Warrington Water-Works Act* extends the limits of the Warrington Water-Works Company, and authorizes the construction of additional works. For these purposes they obtain power to raise additional capital to the amount of £120,000, carrying the usual borrowing powers. The new works include the impounding of the water of some brooks, the sinking of a well, and the construction of a pumping-station.

The following Acts authorize Local Authorities either to acquire undertakings or to construct water-works for themselves :—

The *Bangor Local Board Act*, which has been referred to before, authorizes the Board to purchase the water undertaking of the Bangor Water and Gas Company. The terms on which the transfer is to be effected were set forth in our last.

The *Cheltenham Corporation Water Act* empowers the Corporation of Cheltenham to acquire the undertaking of the Cheltenham Water Company. The Corporation, in the first place, pay to the Company the sum of £5000, for parliamentary and other expenses; they then agree to pay to the ordinary Shareholders annuities to the aggregate amount of £5562, or a lump sum of £139,062. It is at the option of the Shareholders whether they will take annuities or receive a sum in gross. The preference Shareholders are to receive annuities equal to the rates of interest they have received from the Company. The Corporation, of course, assume the mortgage debt of the Company. The present Manager of the works is to be continued in his situation, or compensated. The Corporation take power to borrow all such sums as may be necessary to redeem mortgages and annuities, with further moneys to carry on the undertaking.

The *Drumcondra, Clonliffe, and Glasnevin Township Act* deals with matters of purely local interest to the townships concerned, in the neighbourhood of Dublin, and need not here be further noticed.

The *Exeter Corporation Water Act* empowers the Exeter Corporation to acquire the undertaking of the Exeter Water Company and the paper scheme of the Dartmoor and Exeter Water Supply Company, Limited. The matter has been so fully noticed in our columns of late that nothing further need be added here.

The *Leicester Corporation Act* is to vest the undertaking of the Leicester Water-Works Company in the Corporation of that borough. In this case also the consideration to be paid for the transfer, and all other details, have been so recently mentioned in our columns that further notice is not required.

The *Scarborough Corporation Water Act* authorizes the Corporation of that borough to acquire the undertaking of the Scarborough Water-Works Company. Everything relating to this transaction has been already fully detailed, and need not be here noticed.

The *West Houghton Local Board Act* empowers the Local Board of that place to provide their district with a supply of water. They are to take it in bulk from the Corporation of Bolton at sixpence per thousand gallons. The Local Board also take power to make the usual charges, with the customary extras.

The *Weston-super-Mare Improvement Commissioners Water Act* authorizes the Commissioners of Weston-super-Mare to acquire the undertaking of the local Company, and to supply the town and surrounding district with water. The authorized capital of the Company is £24,000, of which £22,350 has been paid up. The consideration to be paid by the Commissioners is £65,000. The other matters in the Act do not require special notice.

It is worth mentioning that, in every case in which an Act transfers a statutory undertaking to a Local Authority, the powers conferred by the Special Acts are transferred to the Authority. So far as regards new undertakings started, the Corporations obtain all the powers usually conferred on Water Companies.

The Acts conferring further powers on Local Authorities with respect to water undertakings are as under :—

The *Batley Corporation Water-Works Act* is of purely local interest, and need not here be mentioned.

The *Bedlington Local Board Water Act* is simply to empower the Local Board to acquire some water rights for the purposes of their undertaking.

The *Bradford Water and Improvement Act* is to authorize the Corporation of Bradford to construct additional water-works, and also to extend the time for the completion of works already authorized. For water purposes they obtain power to borrow the additional sum of £140,000.

The *Cockermouth and Workington Water Act* is to empower the Local Boards of Health for those districts, and the Urban Sanitary Authority, to add to their water supply by tapping Crummock Lake. We have referred to this case before, as an instance of the appropriation of one of our Cumberland lakes to useful purposes. As Crummock Water is not considered a specially ornamental lake, and as great engineering works are not projected to affect the scenery, such as it is, the desecration, as some would call it, passes unnoticed. The general provisions of the Bill need not be referred to.

The *Dublin Corporation Water-Works Acts Amendment Act* is to enable the Corporation of Dublin to construct additional works in the neighbourhood of their existing works.

The *Forfar Water Act* is to enable the Commissioners of the burgh to furnish a better supply of water to the inhabitants of their district. The details are of purely local interest, and all that need be said is that the charges are to be fixed on annual estimates.

Correspondence.

[*We do not hold ourselves responsible for the opinions expressed by Correspondents.*]

THE EDUCATION OF THE GAS MANAGER OF THE FUTURE.

Sir,—Your numerous readers have been treated with the views of several correspondents upon the above theme, and, accepting your invitation, I purpose falling in with a few words upon the same subject, but in rather a different strain. The writers have contributed their ideas with such a oneness of thought, as to show that not only is a considerable amount of interest being taken in the question, but that many are much exercised concerning it. In fact, considering that the matter has been so vigorously—not to say unexpectedly—dealt with in your columns, one feels almost forced to believe that some terrible catastrophy has brought the question to the front.

In contradistinction to some writers, I fearlessly assert that the gas manager of to-day is not by any means the degenerate wretch depicted by them. He may be hard-working, horny-handed, and even scrupulously practical-minded, but I unhesitatingly deny that he is anything like the ignorant dolt which one would expect to find him from the statements made. To elaborate with so much exactness of detail the numerous acquirements essential to the proper qualification of a gas manager is, by way of implication, but a mode of stating that they do not possess such knowledge, and is, I submit, quite an unwarrantable assumption. Again, the inference that the self-made and self-raised gas manager is an ignorant follower of antiquated systems and ideas is not a correct one. It has fallen within the bounds of my experience that obstinate adherence to old-fashioned appliances is not confined to men of any particular grade or position in life.

Too frequently it is to be found that the man of "good standing," when introduced to improved methods of manufacture, proudly shrugs his shoulders, drives his hands deeply into his pockets, as if to protect the "needful" in them, and discourages the inventor by disdainfully concluding that, as it was not introduced by some "authority" in gas matters, or should it not bear his approved brand, it may be of some service; but finishes the interview with a desire to wait and see what others think of it. That is the pattern, generally speaking, of the theorist. The practical man looks with an eye to its possible utility, and deliberates upon the feasibility of its fulfilling the conditions required. It is to the man skilled in mechanics to whom we must look for the encouragement of improvements; when the theorist shows a liberality in this direction, he follows the bent of his leanings to the practical, and not to the theoretical position. A theorist may overwhelm a blacksmith with a volume of particulars as to the heating power of a certain quantity of coal, and its effect upon the thing to be moulded into a desired shape, and no end of details as to the tension power of the iron so manipulated, and the precise quantity of atmo-

spheric air the bellows is capable of forcing into the fire in a given time. while the holding of the smith's tongs would prove a "floorer" for him, In small gas-works the manager is generally the factotum of the concern, and if he is at all ambitious to rise in the world, he has to study a variety of subjects connected with his work; and it must be conceded that the prominent positions now held by gentlemen who have risen from comparative obscurity in different parts of the kingdom, evidence that they do not control the businesses entrusted to them other than to the interest of the general public. On the contrary, the very satisfactory condition of the gas industry proves that practical men have not wasted their time; and if it does not fall to the lot of every man to introduce improved appliances, it by no means follows that such persons have no inborn genius.

Every gas manager has, to some extent, difficulties to overcome and problems to solve which are a tax upon his mentality, thus making the theorist of him; and there are very few men to be met with who have not done some good work, achieved some triumph over a difficulty in engineering, involving much anxiety and mental labour. The combination of gained experience with an anticipation of possibilities culminates in many praiseworthy successes, and a little more communion with the painstaking self-made managers of small gas-works will but confirm the position I have taken in regard to this matter. At least, such men can earn their bread; a simple theorist would starve, if similarly situated, and with the disappearance of his mental light the gas-flame would cease to shed its brilliant rays until resuscitated by the practical man.

But we are told that such a man places coal into the retort, permits it to remain therein the orthodox time, &c., &c., without knowing what takes place within it. Now, such operations are performed in like manner in multitudes of instances, and, for my part, I fail to see why we should be appalled that the work should be carried out by men who are ignorant of the chemical changes which the coal undergoes during the process of distillation, nor can I see why we should be disconcerted at such a spectacle, knowing that there would not be the remotest improvement in the gas produced, even if he were well posted in the details of the chemical transformations effected. After all, there seems to be too much stress laid upon the benefits said to be derivable from the possession by every gas manager of such knowledge, and which would be, in ninety-nine cases out of a hundred, but an embellishment of very doubtful value. Not that an acquaintance with chemistry would be injurious, or prejudicially affect the interests of managers of small gas-works; but it is possible to have too much, even of a good thing, and to such men the acquisition would be useless.

A student green from the college, rejoicing in the possession of the (to be) "Association Certificate" of his fitness for an important post in gas-works, would in all probability find that many contingencies arise in every-day life, making demands upon his resources for which he would find himself unprepared. Books cannot anticipate unexpected conditions which arise beyond the margin of previous experience, and many commercial transactions require a training which the world, and not a college, fits a man to cope with. The necessary degree of tact, &c., to successfully control workmen depends upon very different conditions to those which regulate the experiments in a laboratory. Furthermore, success in life does not always follow opportunities, and many a man who might fail at an examination would most probably possess many sterling qualities for business. Persistent struggling against difficulties has brought many heroes from the ranks of labour to the front; and many, if not most, of the grandest achievements in the realms of science, art, and manufactures have been due to those whose starting-point in life may be traced to the cottage, rather than to the stately mansion, or the exclusive precincts of the college.

The trifling disadvantages connected with our so-called "rule-of-thumb" system would be superseded by the pecuniary loss and anarchy of the new order of things. Men are men, and sometimes imperfectly so, and so long as we have to wait for the millennium of perfection in gas engineering we must be content, more or less, with the much-despised "rule-of-thumb" way of carrying on the business.

With all deference to the opinions of writers upon this question, the attempt to supplant individual effort by an organized or mechanical contrivance for turning out in effulgent perfection the "theoretical man," whose superiority over the "practical man" has been vaunted in your columns with as much assurance as if the truth of the assumption were as clearly established as an accepted axiom in mathematics, will, I opine, land such a theoretical absurdity into the befitting regions of "Utopia."

Abersychan Gas-Works, Oct. 3, 1878. WM. WHITE.

SIR,—I am much pleased that this subject should receive that attention which the large interests at stake ought to command for it, and trust that the letters now appearing in your JOURNAL may assist in bringing about greater uniformity of opinion, in regard to essential matters of detail, than has hitherto existed.

The "Register of New Patents" shows there is no want of active minds striving after improvement, but a sad want of practical knowledge. Otherwise the large field would long ago be entirely exhausted, leaving nothing for the "Intelligent Gas Manager of the Future" to discover. I would, however, venture to assert that the great majority of Engineers and Managers of our large works are not deficient in regard to a thorough knowledge of their profession, both theoretical and practical. The peculiar nature of the machinery, and the difficulty of making sweeping changes, no doubt prevent them from adopting every suggestion, although apparently worthy of attention; but it will be found that all are moving onward to something better, so far as their various circumstances will permit.

While cordially supporting the necessity of having men of superior education at the head of the profession—whatever their antecedents may have been—I still believe the "Frugal Stoker," transmuted into a Gas Manager, will always find a situation. It is scarcely to be expected that the smaller class of works can afford to maintain a chemical laboratory for the advancement of their manager. What is required, in many hundreds of cases, is a man with tact, patience, and perseverance, qualified to act as manager, secretary, and collector; also to lay service-pipes, and repair meters when required. It is very doubtful if the gas engineer of superior education would stoop to perform these duties.

When we see men, standing high in the scientific world, so much at variance in regard to what is required to constitute model gas-works, it need not be matter of surprise that experience should often be preferred to theory. A STOKER.

SIR,—I see in the JOURNAL for Sept. 17, that a correspondent, signing himself "Isca," has opened the question of the Education of the Gas Manager of the Future. In his letter he has remarked that frugal stokers become gas engineers, aided by fortuitous circumstances, in the same way that ambitious carpenters become architects, with the result of timid or obstinate adherence to any practice, however cumbrous, or which has, in their eyes, proved safe, and passably successful. Now, Sir, as a frugal stoker myself, and speaking in the interests of others of my class, I shall try and prove myself worthy of being admitted as a part to make up "Isca's" future manager as a whole.

I wish to speak bluntly and to the point at once. Are there as many managers who would make good stokers as there are stokers who would make good managers? I should hardly like to guess myself, but I contend this (not like your correspondent signing himself "Cum multis Aliis," that the theoretical man is the better of the two), that no amount of theory will make a gas manager, according to "Isca's" ideas, without actual practice. And if your correspondent has had the experience he says, in works making from 3 to 20 millions per annum, my remarks must strike him with double force if he refers to his experience at the smaller of the two works named by him.

Your same correspondent speaks of the "Frugal Stoker" as too ignorant to move out of his accustomed groove. He says he looks with disdain upon any new thing, unless there is a very obvious saving of labour or trouble on the face of it. What is a saving to the man is the same to the master, but as I intend to answer his letter further at some future time, I will ask any manager whether that man is not to be preferred who does the most work with the smallest amount of labour.

I quite agree with a remark made by your correspondent, Mr. John B. M'Crae, of Bury St. Edmund's, that there is something to learn everywhere, either to imitate or avoid, and I would advise every one who intends becoming a manager to reject no hint, let it come from the manager or the man.

There is one thing different from Mr. M'Crae I would advise in the examination of candidates—let them be frugal stokers, or brimful of theory gathered from your valuable JOURNAL—which is to have twenty questions put, an equal number on the theory and practice, and let them then and there be answered verbally; then I shall look forward to my pet frugal stoker not being entirely behind in the race for the Gas Manager of the Future. A FRUGAL STOKER.

THE ESTIMATION OF SULPHUR IN COAL GAS.

SIR,—Mr. Charles Heisch, in his letter published in the JOURNAL of the 17th of September, asked me what I meant by making experiments "analogous" to those of the Gas Referees. Perhaps the word analogous was not chosen very well; but I should have thought that some *grammatical* faults would have been forgiven a Dutchman. I meant by the word "analogous" that the tests which I made were done with quite the same apparatus that is used in London for the estimation of sulphur in coal gas. I obtained the apparatus from Mr. Sugg.

Since that time I have made another test One-half of the liquor from 10 cubic feet of gas was treated with NO_3H. The result was 0·2052 gram SO_4 Ba, or 0·2005 gram in 1000 litres = 8·75 grains S in 100 cubic feet. The remaining half was treated only with HCl, and yielded 0·1528 gram SO_4 Ba, or 0·1493 gram in 1000 litres = 6·51 grains S in 100 cubic feet of gas.

In this test the difference was not so great as in former tests. However, it was too great, and I think it is of much importance when a sulphur maximum is fixed.

I believe there is no reason in using only HCl, and it would be better if NO_3H were always added to the liquor. The result would then be the true. When treated only with HCl it is below the truth, and I think it would be better if the instructions of the Gas Referees were changed in that manner.

Haarlem, Sept. 28, 1878. A. J. VAN EYNDHOVEN, Chemist.

LIEGEL'S GENERATOR FURNACE.

SIR,—Referring to the illustration and description of the Liegel furnace which you published in your number for Sept. 17, Herr Liegel has asked me to say that, besides the towns therein mentioned, his system of heating retort-settings has been applied at the gas-works in the following German towns—viz., Hanau, Offenbach, Bromberg, Regensburg, and Posen; also at Stockholm and Gothenburg, in Sweden; and at the Buda Gas-Works (Buda-Pesth), in Hungary.

He has also sent me the following statements of working results obtained where his furnaces have been introduced.

At Stralsund, one setting of seven retorts carbonizes five tons of coal a day, and produces 52,500 cubic feet of gas, or 10,500 feet per ton, and 7500 feet per retort per diem. The coal used is Leverson Wallsend, and the fuel account is 15·4 per cent. of the weight of the coal carbonized.

At Regensburg, in Bavaria, where Bohemian coal is used, a setting of six retorts, fired according to the ordinary method, produced, on the average, between 9000 and 10,000 feet per ton of coal, and 5500 feet per retort per diem, with a consumption of 30 per cent. of fuel. Since the reconstruction of the retort-settings on the Liegel plan, each setting, containing eight retorts, and heated by a generator furnace, carbonizes six tons of coal a day, and produces 65,000 feet of gas, being at the rate of 10,830 feet per ton, and 8125 feet per retort per diem, and the fuel account is 14·58 per cent.

At Offenbach, a setting of seven retorts formerly carbonized 4½ tons of coal, and produced 42,000 feet of gas every 24 hours, which is equal to 9880 feet per ton, and 6000 feet per retort per diem. The settings of eight retorts erected on Liegel's plan carbonize at present eight tons of coal, and produce 84,000 feet of gas, or 10,500 feet per

ton, and an equal quantity per retort per diem. In this case the fuel account is 15·6 per cent., the coal carbonized being a mixture of Westphalian and Saar Valley coal.

These results appear at first sight almost incredible, but it is evident that an intensity of heat unknown in English gas-works is maintained in these settings, from the fact that Herr Liegel cannot carbonize Newcastle coal at his highest heats, for, he says, the tar deposited in the hydraulic main and ascension-pipes is so thick as to cause complete stoppage of the apparatus. With German coal this is not the case.

There can be no question, I think, that the regenerative principle is a more scientific method of heating than the ordinary direct method. It places the combustion of the fuel under much better control, and the results of its application to the furnaces of retort-settings prove that a greater proportion of the heat developed is made effective than is the case when the ordinary furnace is used. I therefore think that it is quite time we turned our attention seriously to this improvement, and, for my part, I intend to introduce the Liegel furnace into my works at the earliest opportunity, and shall be glad to be of use to any others who may be inclined to make trial of it.

G. E. Stevenson.

Gas-Works, Peterborough, Oct. 3, 1878.

THE COST OF COAL AND THE PRICE OF GAS.

Sir,—Mr. Henry Woodall objects to my figures of the cost of coal during the three years of high prices. I gave those figures as an illustration, to show that the enhanced value of residuals did not compensate for the increased cost of coal. Coals costing 14s. 9d. per ton returned 55 per cent. for residuals, whereas coals costing 24s. 5d. returned less —*i.e.*, 53 per cent.

Mr. Woodall very ingeniously provides a reserve-fund to meet fluctuation in the cost of coal. This is begging the question he raised in his report to his principals.

I submit that "interest, manufacturing charges, maintenance of works and mains," and even "salaries," increase pretty much in proportion to the increased sale of gas. If Mr. Woodall could induce his customers to use gas for cooking during the summer, and discontinue its use, other than for lighting purposes, during the winter, I admit that an increased profit would accrue, because the additional use of gas would not entail additional cost, except for coals, purification, and wear and tear of retorts; but, if our customers use gas other than for lighting purposes, I give my experience (which may not be confirmed by others) that the gas so used is greater in winter than in summer—*ergo*, additional plant follows, and no *special* increase in profit accrues from summer use of gas for heating purposes—which Mr. Woodall would lead his principals to believe would amount to 16d. per 1000 feet.

Mr. Woodall explains that he "never said anything so preposterous as that the cost of coal did not influence the price of gas." I accept his explanation, and would respectfully point out to him the danger of issuing a public document commencing with the paragraph I took exception to, which clearly leads one to infer that gas manufacturers ought not to defer compliance with the demands for cheaper gas "until they can buy coal cheaper."

R. H. Jones.

Dover, Oct. 3, 1878.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

Abstract of the Quarterly Report of the Chief Gas Examiner.—Dr. Williamson, F.R.S., the Chief Gas Examiner, has just issued his report on the gas supply of the Metropolis for the quarter ending Sept. 30, 1878; and the following is an abstract of it:—

With regard to Illuminating Power.—The maximum, minimum, and average illuminating power in standard sperm candles at each of the testing places, were as follows:—

	Max.		Min.		Aver.
The Gaslight and Coke Company—					
Beckton	18·5	..	16·0	..	17·1
Friendly Place	17·6	..	16·2	..	16·6
Millbank Street	24·3	..	20·3	..	22·1
Ladbroke Grove	19·5	..	16·0	..	17·4
Devon's Road	17·9	..	16·4	..	17·1
Carlyle Square	18·8	..	16·5	..	17·1
Camden Street	18·8	..	16·2	..	17·1
Graham Road	18·9	..	16·2	..	17·6
South Metropolitan Gas Company—					
Hill Street	17·7	..	15·7	..	16·8
Commercial Gas Company—					
Parnell Road	19·7	..	16·0	..	17·9
Wellclose Square	18·0	..	16·6	..	17·1

At all the stations of The Gaslight and Coke Company the minimum illuminating power was equal to, or above, the requirements of their Acts of Parliament.

At the Hill Street, Peckham, testing-station of the South Metropolitan Gas Company, the illuminating power on three occasions during the quarter was slightly below those requirements, whilst the average was above them.

The gas made by the Commercial Gas Company averaged well above the parliamentary standard, and only once fell down to that standard.

As regards Purity.—Sulphuretted hydrogen was not present in the gas at any of the stations. The proportions of sulphur in other forms than this were as follows:—

Grains of Sulphur per 100 *Cubic Feet of Gas.*

	Max.		Min.		Aver.
The Gaslight and Coke Company—					
Beckton	13·4	..	5·6	..	10·3
Friendly Place	14·9	..	5·6	..	11·0
Millbank Street	14·5	..	8·5	..	11·5
Ladbroke Grove	37·4*	..	6·0	..	11·3
Devon's Road	14·8	..	6·4	..	8·4
Carlyle Square	17·7	..	11·4	..	14·2
Camden Street	14·7	..	9·2	..	12·1
Graham Road	18·8	..	7·7	..	11·9
South Metropolitan Gas Company—					
Hill Street	18·9	..	8·6	..	13·6
Commercial Gas Company—					
Parnell Road	26·2*	..	8·0	..	12·2
Wellclose Square	21·1*	..	6·3	..	9·3

* Excess.

The maximum at all the stations, with the exception of Ladbroke Grove, Parnell Road, and Wellclose Square, was within the requirements of the Acts of Parliament, and the average in all cases considerably better than required by the Acts.

Ammonia was present to a slight extent in the gas at all the stations, with the exception of Devon's Road.

The station at Millbank Street was temporarily closed during the quarter for repairs, from the 12th of August to the 10th of September; and that at Devon's Road has been closed for the same purpose since the 24th of August.

METROPOLIS WATER SUPPLY.

Metropolitan Board of Works.

At the Meeting of the Board last Friday—Mr. E. D. Rogers in the chair,

Mr. Selway moved—"That it be referred to the Works and General Purposes Committee to consider and report upon the advisability of preparing a Bill to be laid before Parliament, providing for the acquisition by this Board of the interests of the several Companies now supplying the Metropolis with water, also upon what steps it will be desirable should be taken to ensure an improved supply of water to the Metropolis." He said that this subject had been frequently before the Board, but he did not think that there had been any change in the opinion of the members as to its importance since it was brought before them twelve months ago, when they agreed to promote a Bill in Parliament, based on the recommendations, contained in a report of the Royal Commission on Water Supply, that the water supply of the Metropolis should not remain in the hands of the Water Companies. Although, last session, the Bill which they introduced was withdrawn, he believed that public opinion on the question was now more ripe than ever. He saw no reason why the water supply of the Metropolis should not be in the hands of a Corporation, as it was in the hands of the Municipal Authorities of Glasgow, Manchester, Liverpool, Dublin, and more than 100 other places, whereas London formed almost a solitary exception to the rule.

Mr. Lloyd seconded the motion.

Dr. Brewer moved the previous question. He said he did not impugn any of the statements which the mover of the resolution had made as to the importance of the subject, but he looked upon this as an unfortunate time for the question to be brought forward. After what had taken place last year, when their Bill was withdrawn, he thought it premature to again bring the matter forward.

Mr. Watkins seconded the amendment.

After some further discussion, the amendment was put, and negatived by 21 votes to 6, and the motion was then agreed to.

The following are the returns of the Society of Medical Officers of Health on the Composition and Quality of the Metropolitan Waters in September:—

Names of Water Companies.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen— As Nitrates, &c.	Ammonia. Saline.	Ammonia. Organic.	Hardness (Clark's Scale). Before Boiling.	Hardness (Clark's Scale). After Boiling.
Thames Water Companies.	Grs.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	19·80	0·089	0·105	0·000	0·011	13·7	3·3
West Middlesex	19·00	0·089	0·105	0·000	0·010	13·7	3·0
Southwark and Vauxhall	18·40	0·103	0·105	0·000	0·011	13·7	3·3
Chelsea	16·80	0·042	0·129	0·000	0·009	13·2	3·0
Lambeth	20·80	0·096	0·126	0·000	0·010	14·3	3·7
Other Companies.							
Kent	29·90	0·001	0·435	0·000	0·001	20·6	6·5
New River	19·30	0·057	0·150	0·000	0·007	14·3	3·3
East London	17·90	0·053	0·075	0·000	0·007	13·2	3·3

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours; and in the case of the metropolitan waters the quantity of organic matter is about eight times the amount of oxygen required by it.

The water was found to be clear and nearly colourless in all cases but the following, when it was slightly turbid—namely, Lambeth Water Company.

C. Meymott Tidy, M.B., &c.

ANALYSES OF NEW ZEALAND AND AUSTRALIAN COALS.

The following results of trials of various kinds of coals used by the Christchurch (New Zealand) Gas Company have been sent to us by Mr. T. S. Cleminshaw, the Engineer of the works:—

"*Coal Pit Heath Colliery, Ereymonth, New Zealand*—
Coals carbonized, 24 tons 9 cwt. 2 qrs.; gas produced, 298,000 cubic feet; equal to 12,179·8 cubic feet per ton of coals.
Average (three tests) illuminating power, 17·806 sperm candles, six to the pound.

"*Co-operative Colliery Wallsend, Newcastle, New South Wales*—
Coals carbonized, 37 tons 12 cwt.; gas produced, 388,300 cubic feet; equal to 10,327 cubic feet per ton of coals.
Average (three tests) illuminating power, 16·06 sperm candles, six to the pound.

"*Newcastle Wallsend, Newcastle, New South Wales*—
Coals carbonized, 31 tons 15 cwt.; gas produced, 350,880 cubic feet; equal to 11,048·8 cubic feet per ton of coals.
Average (five tests) illuminating power, 16·39 sperm candles, six to the pound.

Photometer used—Sugg's "Letheby;" Referees mode of testing; "London" Argand, No. 1, 24 holes, 7-in. by 1⅛-in. chimney. Gas burnt at 5 feet per hour. Illuminating power corrected for temperature and pressure.

LONDON GASLIGHT COMPANY.

The Half-Yearly Meeting of this Company was held on Wednesday last, at the Freemasons Tavern, Lincoln's Inn Fields—Major Rohde Hawkins, Esq., the Governor, in the chair.

The Secretary (Mr. A. J. Dove) read the notice of meeting, and the following report was presented:—

Annexed to this report are submitted the half year's accounts, which show the result of the manufacture and distribution of gas to June 30, 1878.

On comparing these accounts with those of the corresponding period of 1877, it will be seen that the reduction in the price of gas made last year still leaves a diminution in the rental under this head of £2884 11s. 3d. The sale of residuals has also produced a less amount by £1309 17s. 4d. Notwithstanding these reductions, the result must be regarded as satisfactory. The increased consumption of gas, the continued low price of coal, together with the decrease in other charges connected with manufacture and distribution, enable the Directors to recommend to the meeting that the usual dividend be declared.

After providing for the interest and for the dividends on preference capital, it is accordingly recommended that a dividend at the rate of £10 per cent. per annum be declared on the ordinary stock; the several dividends to be paid on Oct. 15, 1878.

The arrangements for bringing coals to the works without transhipment, referred to in the Directors report made to the Proprietors in October last, have been completed, and steamships are now delivering coals at the Company's wharf, Nine Elms.

No. 1.—STATEMENT OF STOCK AND SHARE CAPITAL, *on June 30, 1878.*

Acts of Parliament relating to the Raising of Capital.	Description of Capital.	Maximum Dividend authorized.	Number of Shares issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Arrears of Calls.	Remaining to be called up.	Total Amount authorized.
15 Vict., cap. 82	Ordinary stock.	10 per cent.	Stock	Stock	Stock	£386,500	..	..	£386,500
	2nd pref. ,, .	6 ditto.*	Do.	Do.	Do.	8,550	..	..	8,550
	3rd ditto ,, .	6 ditto.*	Do.	Do.	Do.	2,100	..	..	2,100
	1st ditto ,, .	6 ditto.	Do.	Do.	Do.	150,000	..	..	150,000
29 Vict., cap. 55. . . .	A ditto shares .	6 ditto.	12,000	£25 0 0	£20 and £1 5s.	186,422	..	£113,578	300,000
20 & 21 Vict., cap. 73 . .	1 & 2 Deb. stks.	6 & 5 ditto.	Stock	Stock	Stock	26,692	..	..	26,692

* With option of conversion.

No. 2.—STATEMENT OF LOAN CAPITAL.

Acts of Parliament authorizing the Loan Capital.	Description of Loan.	Rates per Cent. of Interest.		Total Amount borrowed.	Remaining to be borrowed.	Total Amount authorized.
		4½ per Cent.	5 per Cent.			
15 Vict., cap. 82	Bonds, 4½ per cent. . .	£91,862	£12,107	£103,969	£74,385	£91,667
29 Vict., cap. 55	Debenture stock, &c. .					100,000

No. 3—CAPITAL ACCOUNT.

Dr. Cr.

—	—	Description of Capital.	Certified Receipts to Dec. 31, 1877.	Received since that date.	Total Receipts to June 30, 1878.
To Expenditure to Dec. 31, 1877	£831,535 3 10	By Ordinary stock	£384,900 0 0	£1600*	£386,500 0 0
Balance	10,642 12 6	2nd Preference ditto.	10,000 0 0	†	8,550 0 0
		3rd ditto ditto.	2,250 0 0	‡	2,100 0 0
Total expenditure.	£842,177 16 4	1st ditto ditto.	150,000 0 0	..	150,000 0 0
Balance	22,056 6 2	A ditto shares, £25 each, including amount received in anticipation of calls	185,867 10 0	555 0 0	186,422 10 0
		1st & 2nd Debenture stocks, under 20 & 21 Vict., cap. 73 . . .	26,692 12 6	..	26,692 12 6
		Bonds, &c.	73,907 0 0	‖	73,407 0 0
		4½ per cent. debenture stock . .	30,562 0 0	..	30,562 0 0
	£864,234 2 6		£864,179 2 6	..	£864,234 2 6

Notes.—† Converted into ordinary stock, £1450; ‡ ditto, £150; * total, £1600. ‖ Paid off, £500.

No. 4.—REVENUE ACCOUNT.

To Manufacture of gas—				By Sale of gas—			
Coals, including dues, carriage, unloading, and trimming (see Statement No. 8)	£50,249 9 5			Common gas, per meter, at 3s. 3d. per 1000 cubic feet	£89,937 8 0		
Salaries of Engineers, Superintendents, and other officers at works	2,026 7 3			Cannel gas, per meter, at 4s. 4d. per 1000 cubic feet	5,867 2 9		
Wages (carbonizing)	9,823 11 6			Public lighting, and under contracts—			
Purification, including £935 14s. for labour . .	1,110 8 8			Common gas	9,620 15 11		
Repairs and maintenance of works and plant, materials, and labour, less £157 17s. 1d. for old materials	10,511 3 6			(See Statement No. 10.)	£105,425 6 8		
		£73,712 0 4		Rental of meters.	2,088 12 0		
The Gaslight and Coke Company, for cannel gas		4,923 2 6				£107,513 18 8	
Distribution of gas—				Residual products—			
Salaries and wages of officers (including rental clerks)	£2,246 4 5			Coke, less £1638 8s. 7d. for labour and cartage .	£17,956 13 6		
Repairs, maintenance, and renewals of mains and service-pipes, including labour	3,620 7 7			Breeze, less £259 4s. 6d. do. .	1,109 7 6		
Repairs and renewals of meters	1,527 3 11			Tar, less £14 16s. 8d. do. .	5,696 5 7		
		7,393 15 11		Ammoniacal liquor	4,696 18 4		
Public lamps—						29,458 19 11	
Lighting and repairing		1,482 4 3		Rents receivable		1,711 7 6	
Rents, rates, and taxes—				Transfer fees		11 12 6	
Rents payable	£897 0 0						
Rates and taxes	4,563 11 6						
		5,460 11 6					
Management—							
Directors allowance.	£1,250 0 0						
Company's Auditors	75 0 0						
Salaries of Secretary, Accountant, and Clerks .	1,223 1 9						
Collectors commission	1,901 6 7						
Stationery and printing	423 10 10						
General charges	440 13 4						
		5,313 12 6					
Law charges		174 3 6					
Bad debts		476 2 9					
Depreciation-fund for works on leasehold land .		100 0 0					
Superannuations, sick allowances, and gratuities .		471 6 6					
Repairs of houses		34 18 10					
Total expenditure		£99,541 18 7					
Balance carried to net revenue account, No. 5 . .		39,154 0 0					
		£138,695 18 7				£138,695 18 7	

No. 5.—PROFIT AND LOSS (Net Revenue Account).

Interest on bonds, 4½ per cent. debenture stock, &c., to June 30, 1878.	£2,458 13 4	Balance from last account .	£30,197 14 11
Dividends on preference capital	11,159 5 3	Less dividend on ordinary capital for the half year ending Dec. 31, 1877 . .	19,245 0 0
	£13,617 18 7	Amount carried to reserve-fund to Dec. 31, 1877 . .	£10,952 14 11
Interest on temporary loans.	84 2 2	Amount from revenue account, No. 4	£39,154 0 0
Redemption-fund, reserve per London Gaslight Act, 1857.	750 0 0		
Balance applicable to dividend on ordinary capital .	24,701 19 3		
	£39,154 0 0		£39,154 0 0

No. 6.—RESERVE-FUND.

Balance on June 30, 1878. .	£60,460 0 8	Balance on Dec. 31, 1877 . .	£48,751 17 6
		Interest on amount invested.	755 8 3
		Amount brought from net revenue for the year 1877 .	10,952 14 11
	£60,460 0 8		£60,460 0 8

No. 7.—DEPRECIATION-FUND (for Works on Leasehold Land).

Balance on June 30, 1878. .	£1,900 0 0	Balance on Dec. 31, 1877. .	£1,800 0 0
		Amount brought from revenue account for the half year ending June 30, 1878 .	100 0 0
	£1,900 0 0		£1,900 0 0

No. 8.—STATEMENT OF COALS.

Description of Coal.	In Store, Dec. 31, 1877.	Received during the Half Year.	Carbonized during the Half Year.	Used for Sundries during the Half Year.	In Store, June 30, 1878.
	Tons.	Tons.	Tons.	Tons.	Tons.
Common	10,461	67,209	60,316	52	17,302
Cannel	1,687	3,164	3,529	..	722

No. 9.—STATEMENT OF RESIDUAL PRODUCTS.

Description of Residual.	In Store, Dec. 31, 1877.	Made during the Half Year (estimated).	Used during the Half Year (estimated).	Sold during the Half Year.	In Store, June 30, 1878.
Coke, chaldrons of 36 bush.	3,246	62,059	17,671	42,047	5,587
Breeze ,, ,, ,, .	427	7,142	..	7,516	53
Tar, gallons	188,000	663,424	..	711,424	140,000
Am. liqr., butts of 108 gals.	2,259	11,787	..	13,546	500

No. 10.—STATEMENT OF GAS MADE, SOLD, &c.

Description of Gas.	Quantity (measured by Station Meters).		Quantity Sold.			Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lamps.
	Made.	Purchased.	Public Lights and under Contracts (estimated).	Private Lights (per Meter).	Total Quantity Sold.				
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	632,569	..	49,280	553,460	601,740	6,510	608,250	24,319	5,135
Cannel	..	28,818	..	27,079	27,079	3	27,082	1,736	..

BALANCE-SHEET.

To Capital—				**By Cash at bankers, and in hand**		£12,705 11 2
For balance, per account No. 3	£22,036 6 2			Amount invested—		
Net revenue—				Reserve-fund	£60,460 0 8	
For balance, per account No. 5	24,701 19 3			Redemption-fund	5,748 6 6	
Reserve-fund—				Unclaimed dividends	4,443 10 5	
For balance, per account No. 6	60,460 0 8			Depreciation-fund for works on leasehold land	1,800 0 0	
Depreciation-fund (for works on leasehold land)—				Stores on hand, viz.—		72,451 17 7
For balance, per account No. 7	1,900 0 0			Coals	£13,831 6 7	
Redemption-fund	6,498 6 6			Coke and breeze	2,243 3 2	
Bond, 4½ per cent. debenture stock, &c., interest for amount due to June 30, 1878	1,592 18 10			Tar and ammoniacal liquor	1,187 10 0	
Preference dividends, ditto	11,159 5 3			Sundry stores	4,252 12 6	
Unclaimed dividends	4,969 10 1			Accounts due to the Company—		21,514 12 3
Sundry tradesmen and others, for amount due for coals, stores, and sundries	23,246 14 3			Gas and meter rental, quarter ending June 30, 1878	£32,138 8 10	
				Ditto arrears outstanding	5,000 19 8	
					£37,139 8 6	
				For coke and other residual products	14,085 12 9	
				Sundries	3,637 18 9	
						54,913 0 0
	£161,585 1 0					£161,585 1 0

The GOVERNOR: I shall now merely move that the report be adopted, but I think there are a few remarks which you will expect me to make. There are one or two gentlemen present who have great scientific experience with regard particularly to the subject which is now occupying your minds—namely, the electric light. I dare say we shall hear something interesting from them, and something also which will satisfy you that your property is not very much in danger. You have all heard of this electric light, and I think you must see that there are very great difficulties in the way of its introduction, even supposing for one moment that it was likely to interfere materially with our prosperity. When you find any discovery of this kind hangs fire, as the electric light has, I think you may be quite certain that there are some very material difficulties in making it do that which some people try to persuade us it will do. It is also very difficult to get anything like authentic information about it; in fact, I think you may sum up the whole thing in a few words—namely, that there are very great mechanical and financial difficulties in its introduction, otherwise we should have known more about it. The mechanical difficulties are so great that, even with the immense knowledge of science possessed in this country, you see month after month going by without their being able to adapt it, except for small areas. The financial difficulty is very great, for this reason—that, as far as we can gather, it is extremely expensive, and therefore I doubt very much whether it ever will compete altogether with gas. Then you must recollect that if science is assisting in the development of electricity, science is not standing still in the development of our business. Our business is one not only of producing gas, but practically of distilling coal, and science has aided us very materially. Our gas is better and cheaper than it used to be. This is due partly to science and partly to mechanical improvements; but, beyond this, science has utilized a quantity of materials, the result of the distillation of coal, and which now produce a very good income to the Company. The electric light has very little heat in it. You know that gas can produce a great deal of heat, and heat is of the greatest possible importance for cooking purposes. Gas is now largely used for such purposes, although its use is yet in its infancy. Then with regard to the heat that gas can produce, we must not forget that the electric light can only be produced by the use of engines. If electricity is to be used to light up rooms and spaces, as it may occasionally be, where people are willing to have and to pay for the light—for I do not believe that it will ever compete with gas in point of expense—then I believe under those circumstances we shall find that gas will be the material used to produce the motive power, so that I have really not the faintest shadow of a doubt but that, so far from our future being injured, our future, if it is to be affected in any way whatever, will be improved by this fresh discovery, which I believe will enable us to use our gas in a new field altogether. I hope these few observations will give you all that confidence in the future of our Company which I confess I hold most firmly myself. I now move—"That the report of the Directors and the accounts now laid before the meeting be received and adopted."

Lord KINNAIRD seconded the resolution.

Mr. LENG (of Dundee) said that having been a Shareholder in this and most of the other Metropolitan Gas Companies for the last ten years, and having never previously attended one of their meetings, he might be excused for trespassing a few minutes on their attention. He wished first to make a complaint, and then to urge a recommendation. There had lately been a serious fall in gas stock, and his complaint was that the Directors did not seem to think the cause of it worth the slightest notice in the reports which they issued to the Shareholders. The Directors of this Company were not so costive as those of the Chartered Gas Company, who, dealing with a property valued at nearly 9 millions, thought nine lines of print sufficient for their last half-yearly report, although their property had been depreciated in the market during the half year between 1 and 2 millions. The reason why he had never opened his mouth as a gas shareholder before was that he had been perfectly satisfied with his dividends which had never been less than 10 per cent. The only thing he could not understand was why the shares of the Metropolitan Gas Companies did not generally stand much higher. Take the case of this Company. They had, according to his experience, for the last ten years paid 10 per cent. as steadily as the Bank of England had paid 3 per cent. on Consols; they had reserve-funds amounting to £72,451; they had their district of supply and their price of gas secured by Act of Parliament; and this being so, he held that any Shareholder who parted with his shares, in this or any similar Company, at less than 22 to 25 years purchase of the dividend, was a simpleton. He remembered having a few shares in the Electric Telegraph Company, who, on a 10 per cent. Government guarantee, sold at £250. To all intents and purposes this and similar Companies had a parliamentary guarantee of 10 per cent. dividends, so long as they supplied gas at prices which there was no doubt of their ability to supply at. Why, then, without any fall in the dividends, had there been such a fall in the value of gas stocks? In reply to this question he had been told, "Oh, the Cockneys have amongst them some of the weakest people on the face of the earth. Anything whatever will frighten them, and when one is frightened the rest follow like a flock of sheep. A theatre manager has put up an electric light in the Strand, and straightway they conclude electricity is going to supersede gas, and so they are throwing away their gas stock." Now, he had been studying the electric light for more than two years, and more particularly for some months past. He was a great believer in the electric light; at the same time he did not believe it would injure the property of gas companies one farthing, and he had come to London, some hundreds of miles, out of compassion for the poor people who, in their ignorance, were being frightened into selling their gas shares much below their proper value, to explain why and how the electric light would be introduced, and yet the supply of gas remain unaffected, or go on increasing. He had seen the electric light used through two successive winters in the construction of the Tay Bridge; he had seen it used several nights during the demolition of a public building; he had seen experiments with it by two of the ablest scientific men in Scotland; he had seen it used frequently for street illumination; and he had seen the best effects obtained from it in Paris. He had also read all the books, pamphlets, and articles upon the electric light on which he had been able to lay his hands, and the conclusion at which he had arrived was that the electric light would be one of the lights of the future, but not to the excluding or superseding of gas light. He was satisfied that, for public squares, for some kinds of public buildings and entertainments, and for special illuminations, the electric light might already be regarded as a scientific, although not, perhaps, an economical success. The intense brightness of the light, the want of radiation, and the depth of the shadows were objections to its adoption for domestic purposes. Dr. Siemens, who is the highest authority on the subject in this country, in his lecture in Glasgow on the 14th of March, said: "There is this further inconvenience connected with the electric light, that its rays are so intense that they must not reach our eyes without having first been softened down, either by the interposition of some semi-transparent substance, such as ground glass, or by directing the light against screens, or against the ceiling of the room, as was suggested by the Duke of Sutherland, so as to illuminate by reflection only. . . . Its practical application for large halls and places where powerful light effects are required will, therefore, be a question only of time, while for domestic purposes gaslight will long continue to hold its own, owing to the greater facility which it offers of subdividing the effects of light, and of accommodating its intensity to immediate requirements by simply opening and closing an ordinary tap." The latest and most complete work on electric lighting was the "Practical Treatise, by M. Hippolyte Fontaine," translated by Dr. Paget Higgs, and which, while strongly advocating electricity as "eminently convenient for the lighting of large uncovered spaces or large halls without interior partitions," said, "when it is required to light small places, or even subdivided localities, it is much more advantageous to supply gas, petroleum, or even ordinary oil." If, then, even oil and petroleum were better suited for small places than the electric light, need they be afraid for gas? An important statement was made at the recent meeting of The Gaslight and Coke Company, that the whole proportion of the lighting of the streets was less than one per cent. of the total supply. If, therefore, all the public lighting together were done by electricity, it would not affect the gross revenue one per cent., and the effect on the net profit and dividends would be imperceptible. So satisfied was he that there was no fear of gas being superseded for houses, offices, and shops, that if he had £100,000 to spare he would buy up every share of the Metropolitan Gas Companies offered at present prices. At the same time, it struck him that when the majority of shareholders knew so little of the subject, the position of the companies for a time would be somewhat critical; and if anybody wished to take advantage of the shareholders ignorance, he could run down all the Metropolitan gas shares another 40 or 50 per cent. by issuing a prospectus of a grand Electric Light Company for lighting all London by electricity. A flaming prospectus could be issued, the recent scare would be followed by a regular panic in gas stocks, and the men with brains would buy all the shares which shareholders without brains would dispose of. Now, he held it was for the directors of gas companies, as men of sense and foresight, to protect the shareholders against scares and panics, and this they could easily do. What had been said on the subject, at the meetings hitherto, sounded too much like

> "The schoolboy in the lone churchyard at night,
> Whistling aloud to bear his courage up."

The right way was to look the facts fully in the face. There was no doubt that in certain places, and to a certain extent, the electric light would be adopted, and would be usefully applied. Seeing, then, that the gas companies were established to supply artificial light, why should they not undertake also this latest and most scientific method of illumination? They had a preferential claim to undertake such supply. They had premises on which the manufacture could be conducted. They had systems of distribution that might very possibly be utilized. They had districts, every part of which they knew, and the requirements of which they understood. They had able staffs of officers—engineering and finance—and collecting departments, all of which could be employed for one mode of lighting as well as another. Everything pointed to the gas companies as being the proper parties to undertake the supply of electric light as well as gaslight. He knew that, as a rule, the first impulse of the official mind was to declare it was impossible to move out of the groove in which it had always been working, but it had been part of the occupation of his life to lift officials out of old grooves. He had also mainly succeeded in his own business by adopting new methods and new inventions, and in the light of his own experience he would urge the Directors and Officials of this and every other Gas Company to consider the electric light, not with the view of rejecting, but of adopting it as auxiliary and complementary to gaslight.

Mr. ROBERT RAWLINSON, C.B., said he had been very interested in the remarks to which they had just listened, and he concurred in them. He had just returned from Paris, where he had been living for more than a week, in the midst of what was perhaps the greatest experiment in public lighting by electricity of which they had any record. The place in front of the Grand Opera, and the streets leading from it, were illuminated very beautifully, but he did not know that any practical advantage was gained over the gas illumination in the other portions of Paris. If it gave a stronger light—and he did not think the public were at all benefited by that strength of light—it did not enable them get about more safely. Then unquestionably the light was very unsteady; it oscillated and flickered, and was not pleasant to look upon. He did not bring this as a charge against the electric light, for it might be improved; but it was quite clear,

from scientific explanations with regard to the motive power required for its distribution, that it could not come into competition with gas for general purposes. In order to produce it, they must have powerful engines at short intervals. The light could not be transmitted at present more than some 400 or 600 feet on each side of the generator. They might rest satisfied that every exertion was being made, and every possible care taken to keep the lamps in perfect order, and they knew very well that when arrangements of this description passed from the hands of the projectors, and were put into the hands of the general public, they would not receive the same care; there would be blundering and mistakes, and, in places, the experiment would come to an end. The thing for them to look at, as holders of gas stock at the present time, was the ruinous sacrifice being made in consequence of this scare. Some months ago, he thought it would have been advisable for the Directors to have issued a very brief statement recommending Shareholders not to sacrifice their stock. However, there were difficulties in doing anything of the kind—there were difficulties in advising either on one side or another—but now, speaking publicly, he would say to every Shareholder, "Do not, under this scare, sacrifice your property." Look at the Share Market, and see what dividends were returned, look what their own stock was returning, and then let them consider again, with regard to gas lighting, although its use was general and very extensive, it was not nearly so general or extended as it might and would be made. There was a new form of power coming in, which he had carefully considered—that was, the use of gas for motive power. It was as nearly a new creation as anything he knew, because the gas was used explosively, and one-ninth of the power was produced by gas to eight-ninths by atmospheric air. Beyond the question of a doubt, even if the electric light was utilized for lighting public buildings and large spaces, the power to drive the machine would be produced by gas, and it was a question whether or not the gas, which would be used in driving the machines, would not, if used in its ordinary way, produce as much light as would be sufficient for the purpose for which the electric light was applied. Be that as it might, he agreed with the last speaker that they had no right to pooh-pooh scientific inventions, or to put them on one side as not likely to be useful. They had no right to anticipate that electric lighting would entirely fade away, or would not be improved, but they had a right to look at the future, to contemplate and to contrast it with their property, and to see if there was any possibility of its superseding gas, and act accordingly. He had drawn up a list showing the per centages paid by different shares, according to that day's quotations on the Stock Exchange, and he found that the Commercial Gas Company paid £5 15s. per cent.; The Gaslight and Coke Company, £5 16s. 3d.; the London Gas Company, £5 12s. 6d.; the Imperial Continental Gas Association, with £800,000 of reserve-fund, would pay £6 7s. 6d.; the London and North-Western Railway Company, £4 15s.; the North-Eastern Railway Company, £4 13s. 6d.; the Chelsea Water Company, £3 16s. 3d.; the East London Water Company, £4 10s.; the Southwark and Vauxhall Water Company, £3 11s. 3d. He told them candidly he would rather hold his gas stock than any of the stocks he named, and why should he then be disposed to throw away his £5 12s. 6d. for the Southwark and Vauxhall Water Company's £3 11s. 3d.? It was perfectly absurd, and he did hope that feeble-kneed gas shareholders would take courage, and not be frightened by stock-jobbing tricks or by popular prejudice, and so be induced to throw their property away.

Mr. NORTHOVER said he heard, on very good authority, that the amount paid on one occasion, by the French Government, for lighting up the Rue de Rivoli and the Place de l'Opéra was £2200 for one night. The fact was that at twelve o'clock at night the electric light was put out in Paris, and the gas-lamps lighted, and that was, no doubt, a matter of economy. He thought the Shareholders were very much indebted to the gentlemen who had addressed them. He had been one who had held gas shares all through, and recommended others to do so, for he felt certain that they would remain good paying property. Rather than find fault with the appearance of the electric light, he believed it would be a benefit to them, for they were all apt to go to sleep if they had not something to stir them up. He had not the least doubt that the result of its introduction would be that they would get better gas, and make it more cheaply, which would be both profitable to the Consumers and also to the Shareholders.

The GOVERNOR said the Directors were not unmindful of this question, though they had not said much about it in public. They had availed themselves of the assistance of Mr. Sprague, who had just placed in the hands of the Directors a report which he had written upon the electric light as used in Paris. The Directors proposed to publish and circulate a report of the meeting, in order that Shareholders might be thoroughly reassured as to the value of their property, and Mr. Sprague's report would be included in that publication. [This report is substantially the same as that presented to the Directors of the Commercial Gas Company, which will be found on page 535.]

The motion was then put, and unanimously agreed to.

A dividend was declared at the rate of 10 per cent. per annum on the ordinary stock, payable on the 15th inst.

On the motion of the GOVERNOR, a vote of thanks was passed to the Secretary and the Engineer, for the great ability with which they had carried on the business of the Company. The Company, he said, were in a very prosperous state, and this result was due to the care and attention of the permanent staff.

The resolution was seconded, and unanimously adopted.

The ENGINEER (Mr. Morton), in responding, called attention to the fact that they were now getting their coals up to Nine Elms in ships of 1000 tons burden, so avoiding all the trouble and loss attendant upon transhipment. He believed that within two or three years the saving that would result would amply cover the outlay made in order to provide for unloading such ships, and getting their coals into store. He was always very gratified to receive a vote of thanks from the Directors and others, and thanked the Shareholders very much for the appreciation they had shown of the services of the staff.

A vote of thanks to the Governors and Directors brought the business to a close.

ALLIANCE AND DUBLIN CONSUMERS GAS COMPANY.

The Half-Yearly Meeting of this Company was held on Monday, the 30th ult.—EDWARD FOTTRELL, Esq., J.P., in the chair.

The SECRETARY and MANAGER (Mr. W. F. Cotton) having read the notice convening the meeting, the following report and accounts were taken as read:—

The Directors have pleasure in submitting for the consideration of the Proprietors the annexed statement of accounts and balance-sheet for the half year ended the 30th of June last, duly audited.

The gross receipts derived from all sources amount to £116,257 19s. 9d., the expenditure, including bond and debenture interest, being £81,618 6s. 3d., leaving a net gain upon the half year's working of £34,639 13s. 6d., from which the Directors recommend payment of dividend at the rate of 10 per cent. per annum, free of income-tax. Thus a sum of £29,500 will be absorbed, leaving a balance of £5139 13s. 6d. to be added to the sum of £15,264 4s. 4d., the balance of previous half years, making a total surplus to be carried forward to next half year's account of £20,403 17s. 10d.

The Directors having always in mind the interest of the Public as well as that of the Shareholders, and being satisfied, from the present working of the Company, that they can make a further reduction in the price of gas, have now the pleasure in being able to announce that, after the December quarter next, the price will be reduced by 3d. per 1000 cubic feet in the city of Dublin, and the townships of Rathmines, Pembroke, Blackrock, and Kingstown.

With respect to the plant and works of the Company, all have been maintained in the best possible state of efficiency. The new purifiers, which have been referred to on a previous occasion, are now complete.

DR.—*Capital Account, for the Half Year ended June 30, 1878.*

	Expended this Half Year.	Total to June 30, 1878.
Expenditure to Dec. 31, 1877	..	£705,474 11 8
Expenditure on manufacturing plant, machines, storeage works, and other structures connected with manufacture (not in place of old ones)	2,501 9 7	
New mains and service-pipes (not being in place of old ones), including laying same, paving, and other works connected with distribution	950 1 10	
New meters (not in place of old ones), including fixings, &c.	870 17 1	
Horses, carts, &c.	159 0 0	
Parliamentary expenses	15 0 0	
		4,496 8 6
Total expenditure	..	£709,970 19 11
Balance of capital account	..	27,421 10 1
		£737,392 10 0

CR.—*Capital Account.*

	Certified Receipts to Dec. 31, 1877.	Received during Half Year.	Total Receipts to June 30, 1878.
Share capital	£589,892 10 0	..	£589,892 10 0
Bonds	147,500 0 0	..	147,500 0 0
	£737,392 10 0	..	£737,392 10 0

DR.—*Revenue Account.*

To Manufacture of gas—		
Coals, including dues, carriage, unloading, and all expenses of depositing same on works		£47,628 11 7
Purifying materials, oil, water, and sundries at works		652 2 11
Salaries of Engineers, including Chief Engineer, Superintendents, and officers at works		1,408 0 6
Wages at works		7,325 11 11
Repairs and maintenance of works and plant (including renewal of retorts), machines, apparatus, tools, materials, and labour		6,893 0 5
		£63,907 7 4
Less old material sold		193 10 7
		£63,713 16 9
Distribution of gas—		
Salaries of Surveyor, Chief Inspector, Inspectors, Assistant Inspectors, and Clerks in Light Office		1,207 9 9
Repair, maintenance, and renewal of mains and of service-pipes, including materials, laying and paving, and labour		1,406 16 2
Repairing, renewing, and refixing meters		1,512 3 9
Public lamps—		
Lighting and repairing		453 5 1
Rents, rates, and taxes—		
Rents		821 1 7
Rates and taxes		1,933 17 11
Management—		
Directors allowances		525 0 0
Salaries of Secretary, Accountant, and Clerks, Office-keepers, and Messengers		1,088 0 0
Collectors commission		1,906 1 8
Stationery and printing		173 10 7
General establishment charges and incidentals		1,025 8 2
Auditor		15 0 0
Law and parliamentary charges		479 10 6
Bad debts		818 15 3
Abatements and allowances		606 15 4
Annuity account		500 0 0
Total expenditure		£78,274 12 6
Balance carried to profit and loss account		37,983 7 3
		£116,257 19 9

CR.—*Revenue Account.*

By Sale of gas—	
Gas (381,912,700 cubic feet), at 4s. 6d., 4s. 9d., and 5s. per 1000 cubic feet	£87,342 10 5
Public lighting and under contracts	5,708 9 5
Rental of meters	2,610 3 3
Residual products—	
Coke, less labour and cartage	12,393 6 6
Breeze	658 7 2
Tar	4,282 7 5
Ammoniacal liquor	2,537 13 1
Rents	241 0 8
Transfer fees	53 7 6
Ship *Dispatch*, money received	430 14 4
	£116,257 19 9

The CHAIRMAN said, in asking the sanction of the Shareholders to the report and accounts, he had to congratulate them on the prosperous state of the Company. The profits for the past half year amounted to £34,639 13s. 6d., which, after paying a dividend at the rate of 10 per cent. per annum, would leave a sum of £5139 13s. 6d. to be carried forward, making, with the balances of previous half years, £20,403 17s. 10d. This was a very respectable sum to have in hand to meet possible contingencies on future transactions, though he was bound to add that he knew of nothing, in connection with the Company, that would tend to bring down this balance. On the contrary, he felt confident that each half year would see that fund progress and prosper. During the past half year the Company had obtained 297 new customers—a fact which told very plainly that gas was working into places not previously thought of. The receipts for gas and gas products exceeded those of the corresponding period last year by £3700, while the extra cost of coals to produce that amount was only £130. In addition, he might mention that to maintain the works, and keep them all in proper and efficient working order, a sum of £6893 had been expended entirely out of revenue, while all that had been added to the capital account was £4496 for new outside mains. As to the quality of the gas, it was right to state that the full illuminating power had been strictly kept up. In no case had the gas been below the standard of 16 candles; in almost every case, indeed, it was nearly 17 candles, and this he hoped would be considered satisfactory. Since this time last year the Directors had taken up £28,000 of the 4½ and 5 per cent. bonds, and reduced the interest to 4 per cent. There were now only £8500 of the 5 per cent. bonds, and before the end of the next year he hoped these would be all taken up.

Every little made something, and the reduction of 1 per cent. interest would help, with other things, to keep the dividend steady. He had now to touch upon a subject of importance, both to the Company and the general public. He believed the public were aware that the Directors were impressed with the conviction that the interests of the Shareholders and the Gas Consumers were really identical, and that their true policy was to cheapen gas as much as possible without injury to the property of the Shareholders. After careful consideration of the present position and of the future prospects of the Company, the Board had come to the conclusion that they could safely reduce the price of gas, from the 1st of January next, 3d. per 1000 cubic feet, and he trusted that this announcement would convince the outside public that the Directors were not unmindful of what was due to the Gas Consumers. Before he concluded, he would allude briefly to a subject that naturally attracted a good deal of attention—namely, the electric light. He did not think that it was his province, as the chairman of a gas company, to attempt a lecture upon the electric light; besides, he was quite incompetent to such a task; but he had, with the other members of the Board, paid much attention to the question. He had heard lectures, seen experiments, and read pamphlets on the subject, and there were one or two matters connected with the light which he might mention. In the first place, the standard of an electric light, when first produced from the carbon, was equal to between 500 and 600 candles. That was a light which could not be used for practical purposes, and, therefore, it had to be reduced, by the use of globes, to between 150 and 200 candles; in other words, three-fourths of the volume of light had to be taken away. Again, the difficulties of an equal distribution of the light had not yet been overcome. The converting of its intense brilliancy into the necessary volume had not been secured. They all knew that gas could be reduced—toned down—to any light wished for; it could be made to vary, by the simplest contrivance, from the glare of 100 candles down to the glimmer of a common rushlight. Economy in the use of light and the consumption of gas was, therefore, within the reach of all; but he was unaware that the electric light afforded such opportunities. The subdivision of it had not yet been attained. The light needed constant attention to the carbon points, lest by any accident it should go out. So that, upon a review of the whole subject, he would tell them frankly, as Chairman of the Company, he did not fear the electric light as an invention that would interfere with the Company's profits as a Gas Company. He did not mean to say he did not think very highly of the electric light; on the contrary, he did think it a magnificent invention, but he did not see how it could interfere with their profits. If it was adopted for outdoor lighting in the city of Dublin and the other districts served by the Company, the difference it would make would be the receipt of a revenue of £11,500 a year—a very small proportion of their gross rental of nearly £200,000 a year; and he might add that the profit on the £11,500 for public lighting was so small that, even if it were all deducted from their resources, it would make no appreciable difference in their dividend. He moved the adoption of the report and accounts.

Mr. T. Dockrell said he wished to offer a few observations. He thought no predictions could be made as to the effect of the electric light in competition with gas light, because some time or other an eminent scientific man might show how the electric light could be fully utilized for all purposes. The effect of steam for railway and other purposes had been scoffed at, but they all knew what steam had achieved. While admitting that the Company had been rescued from a state of almost ruin by the Board, and brought to high prosperity, he thought that the late comers into the concern ought to receive more than 5 per cent. dividend. He hoped the Directors would work up the dividend to 10 per cent. for the Shareholders who had more recently joined.

Mr. Brunker said it was perhaps fitting that he, a shareholder, should second the motion for the adoption of the report and accounts, and express, as he believed he did, the satisfaction generally felt at the prosperous condition of the Company. The Shareholders, indeed, had reason to be grateful for the success of the Company and the efficiency of the working, the latter fact being pretty well shown by the absence of complaints, even from that class who delighted to show their ability by abusing the Company in the newspapers. With regard to the electric light, he could not at all share the feeling of Mr. Dockrell. There was no prospect, even dimly, held out that the electric light could compete with gas for private lighting, and, believing that the present generation was safe from opposition in that respect, he was content to leave the change to a different state of things to that futurity as to which Mr. Dockrell was so prophetic. In Paris the electric light was objected to by the ladies who came under its operation. The light gave them a complexion from which they altogether dissented, and it was no small matter to have the ladies in favour of the softer and more mellow gaslight in a contest, if there was one, for public favour. He might mention that, to enable the electric apparatus to be used for private purposes, there would have to be a swiftly-revolving machine, which could only be erected at considerable expense, and he did not think it likely that people would wish to have to deal with such an arrangement in each apartment of the house. It was right to allay any ill-founded fears that the supposed competition of electricity with gas might create, because it was a fact that, since the discussion of the question, their shares had gone down a little, and he feared some money had been lost—not by the sensible people who held to their valuable poperty, but by some who parted with it through misapprehension of the subject. He did not attach any importance to the electric light as a competing agent with gas, and he advised all who were disposed to accept his advice to be similarly guided. In conclusion, he again congratulated the Company on the excellent position of affairs, and expressed his thorough confidence in the permanence of their present prosperity.

Professor Hull, while fully agreeing in the congratulations expressed as to the flourishing condition of the Company, thought there were one or two points to be noticed. The report stated that the new purifiers, referred to on previous occasions, were now completed. He wished to know whether these purifiers, when in use, would cause an increased purity of the gas. In Glasgow he had used a silvered gaselier for two years without any discoloration taking place; but in Dublin a similar gaselier turned black in about three months, showing that a considerable amount of sulphurous acid was given out by the gas during combustion. By the use of bog iron, or the best quality of coals, this evil could be remedied.

The Chairman, replying generally to the observations made, said the Board kept themselves fully informed as to everything that took place in connection with the electric light. If the light ever came to compete with gas, the Shareholders might depend that it would be the Company who would vend it, and that the interests of the Shareholders in that respect would be fully preserved. In answer to Mr. Dockrell, he would point out that the Company were restricted by law to a 10 per cent. dividend, and more could not be paid to the Shareholders. As to the sulphurous acid resulting from the gas, he would remind Professor Hull that this often arose from the proper burner not being used. Where perfect combustion of all the gas emitted did not take place, the effect described by the Professor would occur. The new purifiers he could not say would improve the quality of the gas, but would keep the gas always at its proper standard. The Directors exercised the greatest care in the selection of the coals used for the gas. The best Newcastle and cannel coals were chosen, and mixed in the proportions which the experience and skill of their Engineer (Mr. E. H. Waterfield) showed produced the best gas and the most valuable products. As business men, the Directors had looked forward to the consequence of reducing the price of gas, and they believed they were quite justified in recommending the proposed reduction of 3d. per 1000 feet. The £20,000 of the reserve-fund was not invested, but was in use by the Company. This arrangement was the most advantageous. If the money was invested it would only produce 3 or 4 per cent., and, on the other hand, they would have to raise £20,000 of their authorized capital, on which 7 per cent. would be paid. Such a result would be plainly injurious to the Shareholders. The fund, though used in the concern, was quite as safe as if invested anywhere, and it would be forthcoming whenever needed.

Mr. Dockrell observed that Parliament ought to be asked to give power to the Company to increase the dividend beyond 10 per cent., so that the new Shareholders, who now received only 5 per cent. on the price they had paid for their shares, might be enabled gradually to get up to 10 per cent.

The Chairman said he was sure such an application would be futile. Earl Redesdale was very chary, when the Company were last in Parliament, of giving them power to raise the £50,000 of additional capital, and took care to limit the dividend thereon to 7 per cent.

The motion was then unanimously adopted.

On the motion of the Chairman, seconded by Mr. Tallon, the dividend mentioned in the report was declared.

Mr. Kenny, P.L.G., said he would like to know from the Chairman whether it was quite right that one of the Directors of the Company should be the very gentleman who of all others in the city was doing most to popularize the electric light, which many yet held would be a formidable competitor of gas.

The Chairman said, without consulting his colleagues, he would undertake to say, on the part of the Board, that they were greatly indebted to Mr. Wigham, the gentleman referred to, for the valuable information which his scientific knowledge enabled him to give in reference to the electric light. Mr. Wigham had been of the greatest possible service to the Company in that respect, while at the same time he did not do anything in the slightest degree injurious to the profit, or the interest of the Company. If he had done so, Mr. Wigham would be the very first to suggest his retirement from the Board.

Mr. Kenny said he mentioned the matter because it was the subject of comment out of doors. No one knew better than he did how much Mr. Wigham was respected as a merchant and a man of science.

Mr. Brunker moved a vote of thanks to Mr. Cotton, the Manager and Secretary, to whose abilities and zeal, he said, they all owed so much; and he would couple with Mr. Cotton all the other officers of the establishment, for their care and attention to the business of the Company.

Professor Hull seconded the motion.

The Chairman said he submitted the motion to the meeting with pleasure, as he believed it was well deserved.

The resolution having been agreed to unanimously,

Mr. Cotton thanked the meeting on his own behalf and that of the other officers. He said he sincerely believed that the Company had as good a staff as could be found anywhere, and he was sure that such public and complimentary recognition of their services would stimulate them one and all to fresh exertions to serve the Company.

On the motion of Mr. Tallon, seconded by Mr. Brunker, a cordial vote of thanks was accorded to the Chairman for presiding, and for his valuable services as Chairman of the Board of Directors.

Mr. Brooks, M.P., in putting the motion to the meeting, said, in reference to the electric light, that he quite concurred with the Chairman that the Shareholders need feel no alarm as to their property in the Company. Even if the electric light was capable of being generally used in private lighting, the Directors would be prepared to supply it to the public, while, if the public lighting passed into other hands, the prosperity of the Company would not be thereby affected.

The Chairman having returned thanks, the proceedings terminated.

PHŒNIX GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of this Company was held on Wednesday, the 2nd inst., at the Bridge House Hotel—Edward Horner, Esq., in the chair.

The Secretary (Mr. I. A. Crookenden) read the notice convening the meeting, and the following report and statement of accounts were presented:—

The Directors submit herewith trade account and balance-sheet to June 30 last.

The new gasholder at Kennington, and also that at Greenwich, are advancing towards completion, and are expected to be in use this winter.

The extensions of large mains, and those for ordinary supply, are being continued in order to meet every demand.

At the Vauxhall station, No. 4 retort-house, recently erected, is ready for use, and will afford means to supply gas to any extent that may be demanded during the ensuing winter.

The whole of the works are kept up to a high state of efficiency.

The balance of net revenue account for the half year is £49,593 17s. 6d.

Your Directors recommend that dividends be declared as follows, viz.:—

On the £20 shares, paid in full, at 10 per cent. per annum . . .	£27,000
On the £20 new shares, £16 paid, at 10 per cent. per annum. . .	8,000
On the capitaliz-d stock, paid in full, at £5 per cent. per annum .	3,600
On the new stock, 70 per cent. paid, at 7½ per cent. per annum .	9,450
	£48,050

Less income-tax, leaving a balance of £1543 17s. 6d.

No. 1.—STATEMENT OF STOCK AND SHARE CAPITAL, *on June* 30, 1878.

Acts of Parliament relating to the Raising of Capital.	Description of Capital.	Maximum Dividend Authorized.	Number of Shares Issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Arrears of Calls.	Remaining to be Called up	Total Amount Authorized.
5 Geo. IV., cap. 78.	Shares	10 per cent.	27,000	£20	All.	£540,000	..	..	£540,000
27 & 28 Vict., cap. 139	Stock.	5 ditto.	..	..	All.	144,000	..	..	144,000
Ditto ditto	Ditto.	7½ ditto.	..	..	70 per cent.	252,000	..	£108,000	360,000
Ditto ditto	Shares.	10 ditto.	10,000	20	£16	160,000	..	40,000	200,000
						£1,096,000			£1,244,000

No. 2.—STATEMENT OF LOAN CAPITAL.

Act of Parliament authorizing the Loan Capital.	Description of Loan.	Rate per Cent. of Interest.	Total Amount Borrowed.
27 & 28 Vict., cap. 159	Bonds.	5 per cent.	£30,000

No. 3.—CAPITAL ACCOUNT.

Dr.

To Expenditure to Dec. 31, 1877		£1,072,776 15 2
Ditto during half year to June 30, 1878, viz.—		
New buildings and machinery in extension of works	£14,155 0 0	
New and additional mains and services	4,460 15 6	
Ditto meters	748 1 9	
	19,363 17 3	
Total expenditure		£1,092,140 12 5
Balance		33,859 7 7
		£1,126,000 0 0

Cr.

Description of Capital.	Certified Receipts to Dec. 31, 1877.	Received since that Date.	Total Receipts to June 30, 1878.
By Shares of £20 each	£540,000 0 0	..	£540,000 0 0
Capitalized stock	144,000 0 0	..	144,000 0 0
New stock	252,000 0 0	..	252,000 0 0
Bonds	30,000 0 0	..	30,000 0 0
New shares, £20 each, £16 paid	155,000 0 0	£5,000 0 0	160,000 0 0
	£1,121,000 0 0	£5,000 0 0	£1,126,000 0 0

No. 4.—REVENUE ACCOUNT, *for the Half Year ended June* 30, 1878.

To Manufacture of gas—		
Coals, including dues, carriage, unloading, and trimming (see Account No. 7)	£62,853 4 9	
Salaries of Engineers, Superintendents, and other officers at works	1,438 9 2	
Wages (carbonizing)	13,063 10 7	
Sundries used in carbonizing	236 4 1	
Purification, including £930 11s. 1d. for labour	1,675 13 9	
Repairs and maintenance of works and plant, materials, and labour, less £735 3s. 4d. received for old materials, &c.	20,892 10 6	
		£100,159 12 10
Distribution of gas—		
Salaries and wages of officers (including Rental Clerks)	£1,932 3 9	
Repairs, maintenance, and renewals of mains and service-pipes, including labour	5,531 1 5	
Repairs and renewals of meters	2,029 10 9	
	9,492 15 11	
Public lamps—		
Lighting and repairing		2,781 5 5
Rents, rates, and taxes—		
Rents payable	£454 9 0	
Rates and taxes	4,766 4 11	
	5,220 13 11	
Management—		
Directors allowance	£1,500 0 0	
Company's Auditors	100 0 0	
Salaries of Secretary, Accountant, and Clerks	1,258 2 6	
Collectors commissions	2,247 9 1	
Sundry expenses relating to collection	78 2 11	
Stationery and printing	726 1 0	
General charges	547 2 11	
	6,456 18 5	
Gas Examiner		69 6 0
Law and parliamentary charges		155 4 0
Bad debts		513 9 10
Superannuation allowances		608 11 8
Insurance		81 13 3
Total expenditure		£125,539 11 3
Balance, carried to net revenue account (No. 5)		50,650 13 2
		£176,190 4 5

By Sale of gas—		
Common gas, per meter, at 3s. 4d. per 1000 cubic feet	£121,240 4 10	
Public lighting (common gas)	12,736 16 7	
		£133,977 1 5
Rental of meters		2,960 9 6
Residual products—		
Coke	£22,448 1 8	
Breeze	556 1 11	
Tar	6,959 17 1	
Ammoniacal liquor	8,010 17 10	
		37,974 18 6
Rents		1,277 15 0
		£176,190 4 5

No. 5.—PROFIT AND LOSS (NET REVENUE) ACCOUNT.

Interest on bonds to June 30, 1878	£750 0 0	Balance from last account	£47,184 18 11
Interest on loans and consumers deposits	332 13 11	Amount from revenue account, No. 4	50,650 13 2
Dividend for half year to Dec. 31, 1877	42,150 0 0	Interest received	25 18 3
Amount invested	5,034 18 11		
Balance applicable to dividends	49,593 17 6		
	£97,861 10 4		£97,861 10 4

No. 6.—RESERVE-FUND.

Balance on June 30, 1878	£110,776 15 2	Balance on Dec. 31, 1877	£103,501 3 3
		Interest on amount invested	2,240 13 0
		Amount brought from profit and loss	5,034 18 11
	£110,776 15 2		£110,776 15 2

No. 7.—STATEMENT OF COALS.

Description of Coal.	In Store on Dec. 31, 1877.	Received during the Half Year ending June 30, 1878.	Carbonized and Used during Half Year ending June 30, 1878.	In Store on June 30, 1878.
	Tons.	Tons.	Tons.	Tons.
Newcastle	17,699	72,708	82,469	7,938
Cannel	448	1,524	1,788	184
	18,147	74,232	84,257	8,122

No. 8.—STATEMENT OF RESIDUAL PRODUCTS.

—	In Store on Dec. 31, 1877.	Made during the Half Year ended June 30, 1878 (estimated).	Used during the Half Year (estimated).	Sold during the Half Year ended June 30, 1878.	In Store on June 30, 1878.
Coke, chaldrons of 36 bush.	3,970	84,257	19,522	67,482	1,223
Breeze, ditto ditto	399	5,789	..	5,920	268
Tar, gallons	89,759	825,391	..	837,230	77,920
Am. liqr., butts of 108 gals.	2,080	24,095	..	24,097	2,078

No. 9.—STATEMENT OF GAS MADE, SOLD, &c., IN CUBIC FEET.

Description of Gas.	Quantity Made.	Quantity Sold.			Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lamps.
		Public Lights and under Contracts (estimated).	Private Lights (per Meter).	Total Quantity sold.				
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	834,891	63,011	732,024	795,035	9,198	804,233	30,658	6,001

No. 10.—BALANCE-SHEET.

To Capital—		
For balance, per Account No. 3		£33,859 7 7
Net revenue—		
For balance, per Account No. 5		49,593 17 6
Reserve-fund—		
For balance, per Account No. 6		110,776 15 2
Unclaimed dividends		119 4 3
Sundry tradesmen and others for amounts due for coals, stores, and sundries		32,849 2 0
		£217,198 6 6

By Cash at bankers		£25,422 2 2
Amount invested—		
Reserve-fund		110,776 15 2
Stores on hand, viz.—		
Coals	£6,169 12 4	
Coke and breeze	546 11 6	
Tar and ammoniacal liquor	1,073 0 2	
Sundry stores	3,077 2 5	
		10,866 6 5
Accounts due to the Company—		
Gas and meter rental, for quarter ended June 30, 1878	£49,041 8 9	
Gas and meter rental—arrears outstanding	1,575 7 11	
	50,616 16 8	
Coke and other residual products		16,699 7 9
Sundries		2,816 18 4
		£217,198 6 6

The CHAIRMAN, in moving the adoption of the report, said: I have to congratulate the Shareholders upon the continued prosperous condition of the Company. No doubt the reduced price of coal has very much influenced the position of the Company, for during the last half year our coals only cost us 14s. 11d. per ton, as against 15s. 1d. last December, and 16s. at this time last year, being a considerable reduction. A shilling a ton, of course, with our consumption, amounts to a large sum. Although we have carbonized rather more coals this half year, the actual cost has been £800 less. The working of the Company has been excellent. The quantity of gas paid for per ton of coal used has been remarkably good,

while the fuel which has been used has been very moderate; taking the breeze and coke together, the fuel has only been about 17 per cent. of the quantity made. The waste of gas also has been less than usual, the leakage, or unaccounted-for gas, being under 4 per cent.—about the smallest quantity I have ever known in this Company. Notwithstanding the reduction of charge, the income from private rentals has increased £1618, as against this time last year. I need scarcely remind you of what an enormous value 1d. per 1000 feet is to us. Over such a very large amount 1d. per 1000 feet is worth, in six months, about £3000, so that if we compare this half year with the corresponding half, the rental, if the same price had been charged, would have been £6000 more than the sum we have actually received, showing to what extent the public have benefited by the reduction. One thing is rather remarkable—namely, that the normal increase of consumption does not appear to go on as one might suppose. It would have been anticipated that with the considerable cheapening of the article, the consumption would have very much increased, but we seem unable to get beyond 4 or 5 per cent. increase in the quantity of gas used. The low price does not appear to increase the consumption to the amount that might have been supposed. During the last half year considerable progress has been made with the works, for the erection of which capital has been called up. The retort-house has been very greatly enlarged. We have also erected a gasholder at Kennington, which is now nearly ready for use, and which is the largest gasholder ever erected by any company, the contents being no less than 3,100,000 cubic feet. This enormous holder does not occupy much more ground than the holder which was previously there, and only contained 600,000 cubic feet. The additional storeage room has been gained by going deeply into the ground and very high up, and it is proposed, when the next holder requires repairing, to follow the same rule, and make the most of our ground. We have also erected another gasholder of very considerable extent at Greenwich, and both will be in use for the coming winter. The net cost of coals to the Company was only about 5s. 10d. per ton, and the quantity of fuel used has been, as I have said, only 17 per cent. Having said this much on the working of the Company, perhaps it may be of a little interest if I say something about the electric light. The electric light has, no doubt, excited a great deal of attention, and probably, amongst some shareholders of gas companies, a certain amount of fear. Since the last meeting the Directors thought the electric light of so much importance that they sent a deputation of the Directors, with scientific assistants, to Paris, to examine into the thing for themselves, and they have to thank the officials connected with the electric light, and everybody in Paris especially, for the facilities afforded to them. The electric light is not a thing to be pooh-poohed. No doubt it is a very beautiful light, and I myself think in all businesses a little competition is not a very bad thing. It may be the means of getting more attention paid to further improvements in the manufacture of gas, and I am perfectly certain that it will lead to great extension of the use of gas. It may surprise some of you if I say that gas in many cases is an exceedingly economical heat, even for working a steam-engine. In my own house I have a small steam-engine in which the steam is generated by gas. It does the work of four men, and costs me only £30 or £40 a year, whereas if I were to have a steam-engine under ordinary circumstances, I should have to have a boiler and a furnace, so that my insurance would be immensely affected. I think people should know that steam-engines, worked by gas, do not affect the insurance of buildings, as this is an exceedingly important thing. With regard to the electric light, of course, beautiful as it is, everything must resolve itself into a question of cost, and I may, I think, give you some figures which have resulted from the visit to Paris, and which may be taken as showing the expense incurred. At one of the large hotels in Paris they have the electric light. They had 48 gaslights, which were calculated to cost, at our price of gas, 4s. 10d. a night. Those gaslights were superseded by eight electric lights, the cost being £1 3s. 4d. Once or twice the lights went out suddenly, and I saw in the French gas lighting paper that at the science *fête* in Paris, in August last, in the middle of the *fête*, the electric light went out, and left them all in darkness, and they afterwards lighted the gas. No doubt many of you have seen the lighting in the Avenue de l'Opéra. That is estimated to cost for gas £885 a year, but the estimated cost for the electric light is £10,625. After all, it must become a question of cost, and I do not think the vestries in the Metropolis will very readily consent to increase the rates to ten times the present amount for the sake of having the electric light. We must look upon the electric light as a great luxury, to be burned only where people do not care about expense. No doubt Paris is *en fête* just now, and the light is very splendid to see. However, of all the business which the Gas Companies do in London, the lighting of public streets is of the least consequence to them. It really would not affect us very much if we lost the whole of our street lighting, which is attended with great expense, and increases at a very small rate as compared with private consumption. In 1869 public lighting with us was only about 12 per cent. of private lighting, and since then private lighting has increased 27 per cent., whereas public lighting has only increased about 8 or 9 per cent. Although the number of public lamps has increased 22 per cent., the amount received for public lighting has only increased in a very small proportion as compared with private lighting. Therefore, I look upon it that 1d. per 1000 feet over the whole concern would cover the loss of private lighting. That is just to show you of what little importance public lighting is to us. I think, therefore, there is nothing to fear from the electric light. There is plenty of room for both of us. It can never supersede gas for the lighting of rooms, because with the electric light there can be no modification; you must have the whole 300 candles dazzling you, however small the room may be. In fact, it is utterly unmanageable, beautiful as it is. You may, perhaps, wish to hear something on the subject of amalgamation; but really, if the statement had not been made in some of the newspapers that negotiations had been going on for amalgamation between the Companies, and if it had not been alluded to by the Governor at the meeting of the Chartered Gas Company, I should have said nothing about it. I have only to tell you there certainly have been negotiations, and, as far as the thing has gone, they have resulted in nothing. You may be quite certain of this, that the first object of the Directors will be to protect the interests of their Shareholders to the utmost extent. With these observations, I beg to move that the report and accounts be received and entered on the minutes.

Mr. Hobson (of Sheffield) said he believed there was a large substratum of small houses where the Company ought to get more consumption of gas, and referred to the case of his own town, where occupiers of a large number of small tenements had been induced to use gas, to the great benefit of the Company. He thought there was ample scope in London for an increase in that kind of business. The residuals did not appear to produce as much as they did in the case of the South Metropolitan Company, but possibly the Phœnix Company were not so well placed for disposing of their residuals. In Sheffield residuals and gas-fittings yielded a 10 per cent. dividend all round, on all new and old stock. As to the electric light, he had had the pleasure of seeing it in Paris, and had arrived at a similar conclusion to that expressed by the Chairman. If the light was likely to be in general demand, he was not prepared to say whether it would not be better for the Company to go into the electric light business, but at any rate they should not be frightened at it. They were quite satisfied of one thing—that in private houses, where lights were wanted in small apartments, gas would be very well able to hold its own; and when it could be supplied, as in Sheffield, at 2s. 7d. per 1000 feet, it would be very difficult to find anything to compete with it. In reply to a question, he added that although the returns of the Sheffield Company were between £80,000 and £90,000 per annum, the bad debts last year were only £231.

Mr. Leng (of Dundee) said ten years ago he invested a little money in eleven of the Metropolitan Gas Companies, and in the interval these Companies had been amalgamated into five. He observed, in the Journal of Gas Lighting, predictions were always made of some very favourable results arising from amalgamation, but he did not always see that those results were obtained. Even with regard to hostile legislation, it was an important question whether they were not able to deal on better terms, and to take more forcible action, if they had a number of strong companies, than if they were reduced to one kitten, round the neck of which a single rope could be tied. He had listened with very great interest to all that had been said about the electric light, which had been a hobby of his own for the last two or three years. He had just come from the meeting of another Gas Company, at which he had recommended the Directors and Officials to consider the electric light, not with the view of rejecting, but of adopting it. If he had time he would attend the meeting of every Gas Company of which he had hitherto been a silent Shareholder, for the purpose of urging, both in the interests of the Companies and in the public interest, that they should supply the electric light in such positions and to such buildings as it was most applicable, as well as gas, where it was most suitable and most convenient. The great error into which public companies, like private individuals, were apt to fall, was in setting their faces against, instead of promoting, improvements—in thinking they ought to oppose what it was their real interest to encourage and turn to account. Now, he confessed he was an enthusiast for the electric light; but his enthusiasm was tempered by business calculation. He considered the electric light a splendid light for some purposes and in some places; but, after careful inquiry, he had come to the conclusion that there were few purposes and few places for which, as yet—he emphasized *as yet*—the electric light could be adopted, having regard to the cost and the method of supplying it. Even for public squares, parks, streets, and buildings, for which it was well adapted, there were the serious objections of heavy original outlay, excessive hourly expenditure, the necessity for steam power near to the place of supply, and the requirement of close personal superintendence. As an illustration, he mentioned that the printing and publishing establishment of which he had the charge contained nearly 300 gaslights, about one-third of which burnt all night for six nights a week. The cost of the gas was £200 a year, or on the average 12s. 6d. per night. No attendance was needed, and the original cost of the gas-fittings was only about £200. Now, he had obtained an estimate for lighting the same establishment with the electric light, and he found he would need 15 Gramme machines, which, at £100 each, would cost £1500. Then the carbons would cost 3d. per hour for each light, being 3s. 9d. per hour, and it would take steam-engines of about 30-horse power, costing, say, 1s. 9d. per hour, to drive the electric machines. Leaving out of account, therefore, the large original outlay—the interest and wear and tear of which would be equal to about £200 a year—the electric light would, in his establishment, cost 5s. 6d. per hour, against 12s. 6d. the whole night for gas. Not only so, but one, if not two, men would be needed to attend the electric burners, and see that they acted properly, while the gas needed no attention whatever. It was clear, therefore, that at present, in works like his, electricity would not be substituted for gas. There were, however, others for which it was better adapted, such as railway depôts, foundries, and engineering establishments. A large manufacturer in Dundee, who had tried the electric light, believed it would come to be generally used in spinning-mills, and it was already in use in some 20 or 30 such works on the Continent. At the present time the application of the electric light was in its infancy; but, if they were wise, they would not shrug their shoulders and put up their backs, and say it would never come to be generally used. He believed that for public places outside, and for large unbroken interiors, it would come to be generally used. With regard to the electric light, as with regard to gas, steam, and the electric telegraph in the past, great improvements in detail would yet be made, and it was for the gas companies, looking forward to the future, to place themselves in a position to take advantage of those improvements, and turn them to account.

The Chairman, in reply, said, with reference to the residuals, he had not seen the accounts of the South Metropolitan Company, but fortunately for that Company their capital was considerably less per ton of coals than the Phœnix Company's capital. The consequence was it did not require so large a sum to make 10 per cent. on the capital as it would in their own. As a manufacturing company, they could only go by the amount of residuals made, and if the South Metropolitan Company had done better than the Phœnix Company had, they had done well indeed. The Phœnix Company actually sold 28·8 bushels of coke per ton of coals carbonized, upwards of 30 gallons of liquor per ton, and 9·79 gallons of tar.

Mr. Livesey said the two Companies sold their residuals at almost the same relative rates. The Phœnix Company used about 50 per cent. more coals, and they had received for residuals about 50 per cent. more than the South Metropolitan Company, so that there was really no difference between them. The difference was in the relative capitals.

The Chairman said they were exceedingly obliged to Mr. Leng for what he had said on the subject of the electric light, and his statement confirmed most completely all the information received by the Directors. At the present time in Paris there was no less than 400-horse power employed in lighting 179 electric lights, while in the garden of the Tuileries alone two engines of 25-horse power were employed for 30 lights. In the Avenue de l'Opéra, the bulk of the light was generated by gas-engines, and more gas probably was consumed in the process than would be required to light the street thoroughly well. Another curious thing, as showing the expense of this light, was that in Paris the electric light was put out at twelve o'clock at night, and the gas was lit. With reference to the Companies themselves taking up the electric light, he was afraid if they would attempt to do it they would find a difficulty on the score of having no parliamentary powers. He was not at all clear, if the thing was likely to succeed, that it would not be a very good thing to be in the swim; to take the matter up; but their present powers would not allow it.

The motion was then unanimously agreed to.

On the motion of the Deputy-Chairman (Mr. James Shand), a dividend was declared for the half year on the £20 shares, paid up, at 10 per cent. per annum; on the £20 new shares at 10 per cent. per annum; on the capitalized stock at 5 per cent. per annum; and on the new stock at 7½ per cent. per annum. He added that the shares of the Paris Gas Company had not fallen, notwithstanding this scare, but had attained their original value. The only effect of the introduction of the electric light in Paris had been to prevent any rise in the price of the shares.

Votes of thanks to the Secretary, the Officers of the Company, and also to the Chairman and Directors, brought the proceedings to a close.

SURREY CONSUMERS GAS COMPANY.

The Half-Yearly Meeting of this Company was held last Friday, at the London Bridge Terminus Hotel—BENJAMIN DUVAL, Esq., in the chair.

The SECRETARY (Mr. W. P. Boddy) read the notice convening the meeting, and the following report and accounts were submitted:—

The Directors herewith submit for the consideration of the Shareholders the annexed statement of accounts and balance-sheet for the half year ending June 30 last.

The revenue account shows a profit of £14,890 2s., which, after allowing for interest on debentures, leaves £13,411 3s. 6d. available for dividend, and the Directors recommend accordingly the usual dividend of 5 per cent., less income-tax. After that, there remains a sum of £2102 16s. 10d. to be added to the former balance of revenue, making together £9245 3s. 1d. to be carried to next account.

As intimated in their last report, the Directors have invested £10,000 in £10,442 2s. 8d. Consols, which is carried to a reserve-fund.

The depreciation-fund stands at £6000, as in the last statement.

1.—REVENUE ACCOUNT, *for the Half Year ended June 30, 1878.*

Dr.				Cr.		
To Manufacture of gas—				By Sale of gas—		
Coals, including dues, carriage, unloading, and trimming	£22,260 17 10			Common gas, per meter, at 3/9 per 1000 cubic feet	£38,784 7 9	
Salaries of Engineers, Superintendents, and other officers at works	680 0 0			Public lighting and under contracts	7,316 18 11	
Wages (carbonizing)	5,115 18 5					£46,101 6 8
Purification, including labour	885 7 3			Residual products—		
Repairs and maintenance of works and plant, materials, and labour	7,057 2 9			Coke, less labour and cartage	£7,460 0 4	
	£35,999 6 3			Breeze	164 10 6	
Less old materials sold	24 0 0			Tar	2,159 9 7	
		£35,975 6 3		Liquor	2,168 8 6	
Distribution of gas—						11,952 8 11
Salaries and wages of officers (including Rental Clerks)	£229 0 0			Interest of moneys on deposit		169 9 0
Repairs, maintenance, and renewal of mains and of service-pipes, including labour	1,601 11 0			Rents receivable		91 0 0
Repairs and renewals of meters	566 14 4			Transfer fees		6 17 6
		2,397 5 4		Rental of meters		1,061 7 0
Public lamps—						
Lighting and repairing		814 19 7				
Rents, rates, and taxes—						
Rents payable	£146 2 7					
Rates and taxes	1,838 0 9					
		1,984 3 4				
Management—						
Directors allowances	£1,000 0 0					
Company's Auditors	52 10 0					
Salaries of Secretary, Accountant, and Clerks	574 8 0					
Collectors commission	627 4 3					
Stationery and printing	164 19 11					
General charges	284 0 5					
		2,703 2 7				
Parliamentary charges		42 3 5				
Bad debts		244 10 1				
Discount allowances		318 16 6				
Public testing-stations		15 0 0				
Total expenditure		£44,492 7 1				
Balance carried to profit and loss account, No. 3		14,890 2 0				
		£59,382 9 1		Total receipts		£59,382 9 1

2.—CAPITAL ACCOUNT.

	Expenditure to Dec. 31, 1877.	Expended this Half Year.	Total to June 30, 1878.		Certified Receipts.	Received during Half Year.	Total Receipts to June 30, 1878.
To Expenditure	£289,521 13 5	..	£289,521 13 5	By Ordinary shares of £10 each	£150,000 0 0	..	..
Balance			478 6 7	,, ,, £10 each, £8 paid	80,000 0 0	..	£230,000 0 0
			£290,000 0 0	Mortgages and bonds			60,000 0 0
							£290,000 0 0

3.—PROFIT AND LOSS ACCOUNT.

Interest on mortgages and bonds to June 30, 1878	£1,478 18 6	Balance from last account		£28,498 11 3	
Balance applicable to dividend on ordinary share capital	20,553 9 9	Less dividend on ordinary capital for the half year ending Dec. 31, 1877	£11,356 5 0		
		Less amount carried to reserve-fund to June 30, 1878	10,000 0 0		
				£21,356 5 0	
				£7,142 6 3	
		Amount from revenue account, No. 1		14,890 2 0	
	£22,032 8 3			£22,032 8 3	

4.—RESERVE-FUND.

Balance, June 30, 1878	£10,000 0 0	£10,442 2s. 8d. in Consols, June 30, 1878	£10,000 0 0
	£10,000 0 0		£10,000 0 0

5.—DEPRECIATION-FUND.

Balance, June 30, 1878	£6,000 0 0	Balance, Dec. 31, 1877	£6,000 0 0
	£6,000 0 0		£6,000 0 0

6.—GENERAL BALANCE-SHEET.

To Capital—		By Cash at bankers	£10,429 7 10
For balance, per account No. 2	£478 6 7	Ditto on deposit	5,000 0 0
Net revenue—		Cash in office	245 10 0
For balance, per account No. 3	20,553 9 9	Reserve-fund	10,000 0 0
Reserve-fund—		Coals, for stock on hand	1,601 5 0
For balance, per account No. 4	10,000 0 0	Gas-rental—	
Depreciation-fund—		Balance of this account due to the Company on June 30, 1878, less deposits and prepayments	19,374 5 10
For balance, per account No. 5	6,000 0 0	Coke and other residuals	3,308 10 10
Debenture interest for amount due to June 30, 1878	1,478 18 6	Sundry accounts	62 10 0
Unclaimed dividends	122 18 1		
Sundry tradesmen and others, for amount due for coals, stores, and sundries	11,387 16 7		
	£50,021 9 6		£50,021 9 6

The CHAIRMAN: Gentlemen, I beg to move the adoption of the report and accounts. I think you will agree with me that the report is a very satisfactory one. We have kept our plant in tolerably good order, we have lowered the price of gas, and, after paying a dividend of 10 per cent. (which I have no doubt you will be pleased to receive), we have carried over £2102 16s. 10d.; so that I think you will not say we have done badly during the six months. The object we always have in view is to do as well as we can for the Shareholders, not forgetting the Consumers, and I trust that as long as you have confidence in us, we shall continue that course, and give satisfaction to all parties. I expected to see a larger meeting to-day, because there has been so much talk about the electric light. I will not go into that matter now, but I dare say some gentlemen will ask questions on the subject, and that our Engineer will be able to answer them satisfactorily. It is no doubt a fact that when new things like the electric light crop up, people get scared and frightened. Now, I do not wish to run the light down. I believe it is a very good thing, but I think it is expensive, and I do not believe it will ever supersede gas in a commercial point of view. I am told that in Paris they light the principal streets by the electric light up to midnight, and then they put it out, and use gas, the electric light being so expensive, costing nearly ten times as much as gas in England. It is a great scheme, and something may come of it; but as long as I live I shall not be afraid to hold my shares in this Company. If I am not the largest Shareholder, I was so, and am still nearly the largest; but I am not frightened, and I shall still hold my shares. I am now an old man, and I certainly am not to be scared by the electric light.

Mr. POCOCK, in seconding the motion, said he was glad that the price of gas had been reduced, believing that in studying the interests of Consumers the Directors were studying the interests of the Shareholders. With regard to the electric light, he was not afraid of it, but it would no doubt be carried out as a matter of public utility, and within three months an experiment would be tried on the Thames Embankment. He had seen Mr. Keates, the Chemist of the Metropolitan Board of Works, who would make his report on Monday, and would recommend that the experiment be tried. For public buildings and squares the light would doubtless be successful, but as gas shareholders they need not be alarmed. The electric light would never be used for cooking purposes, while gas was so employed to a very large extent. He had himself used gas for cooking for the last five years, and he had found it more economical, and more cleanly than coal. He hoped that gas shareholders would not get nervous and frightened, and sell their shares. He had known the Surrey Consumers Company from the commencement; he should still hold on as he had done; and he hoped for many years to come to see the present Board managing the Company's affairs in the interests alike of the Shareholders and the Consumers.

Mr. STORR said he had not attended the meetings for some years, owing to ill health, and he did not attend now in consequence of the electric light, because he did not believe in it. A gas shareholder had no business

to part with a single share. The new light would be useful in large spaces, but not in private houses. The way to meet it was to provide cheap gas. If they were to compete with the electric light, they should do all they could to reduce the expenses so as to let the public have gas as cheap as possible. He believed that as long as coal could be obtained gas would be made, and would successfully compete with the electric light. He wished to have an explanation with reference to the different prices charged by the Surrey Consumers Company and the other Companies. He was a shareholder in every Gas Company in London, and he should be glad to know the reason for the difference in the prices charged.

The CHAIRMAN said that when the Surrey Consumers Company came into the field they had three important Companies to contend against, and had to build their works with materials that had cost an immense amount of money, requiring a very large capital, for which interest had to be found. The Surrey Consumers Company had outgrown their strength. They had paid £18,000 for less than half an acre of land, and they would be quite willing to pay another £18,000 for another half acre close to their works, but they could not get it for love or money.

A SHAREHOLDER asked if a larger dividend would be paid in the event of the price of gas being reduced.

Mr. STORR said his remarks had no reference to the dividend, but his desire was to fight their antagonist, by giving gas to the public as cheaply as possible.

The CHAIRMAN said that was the object of the Directors.

Mr. FINLAY (the Engineer) said that, under the Metropolis Gas Act of 1860, the Company had no power to pay a larger dividend than 10 per cent. It was quite impossible that a company of the size of the Surrey Consumers should ever work as cheaply as a large company. Supposing a company to have a gas-rental of £100,000 a year, if the amount were increased to £200,000, the same board of directors, the same management, with an additional clerk or two, could carry out the business. It would be readily understood that fixed charges must diminish very considerably with an increase of rental. He could assure the Proprietors that the Directors were quite alive to the desirability of reducing the price of gas; but there were other questions to be taken into consideration, and he should be happy to meet any Shareholders at the works, to go into the matter fully, in order that they might clearly understand it. The Surrey Consumers Company were "hung up" for want of land. Only a short time ago he received instructions from the Directors to negotiate for a piece of land in the Deptford Road, and he had offered, subject to the Directors approval, £350 a year on a lease for 81 years; but he did not get it, although the land was now let as a market garden for £5 a year. It had been said by Mr. Thomas Hawksley, one of the greatest men in the profession, "You can do a certain amount of work upon an acre of land; when you have done that, you must go upstairs, and that means money." Unless they could get more land, they could not work as cheaply as other companies. It was true that the Surrey Consumers Company had waterside premises; but they had only been in possession of them a few days, and they had therefore not been able to utilize them. It would be found, on reference to published accounts, that the larger a company was, the less was the cost of management per 1000 feet of gas sold, or per ton of coal consumed; and if there were an amalgamation of all the South London Companies, or, better still, of all the Companies in the Metropolis, the management charges would be scarcely worth notice, being extended over so large an area. It was quite clear to his mind that, being, as they were, the smallest Metropolitan Company, they could never work at the same advantage, or for the same price, as a company with double or treble the rental. They were surrounded by docks on one side and streets on the other, and there was no possibility of stretching in that neighbourhood. In the event of their not amalgamating, the only remedy he knew would be to go to Parliament, and build works somewhere down in the marshes; but that, of course, would cost a considerable sum.

Mr. STORR said he was very much pleased with the explanations that had been given. He was quite aware what amalgamation would do. He was a very old Shareholder in the Chartered Company, and one of the original Shareholders in the Western Company, and also in other companies, and they all knew the benefits of amalgamation in those cases. No doubt it would be a similar advantage on the south side of the Thames, because the same staff could manage 500 men as well as 100, and manufacture 100,000 feet of gas as well as 20,000 feet. He was not before aware of the enormous expenditure of the Company for land, which, of course, made a great deal of difference between the two Companies he had referred to.

Mr. JAMES (the Deputy-Chairman): I do not think it would be right, after what has passed on the subject of amalgamation, to allow this meeting to separate without telling you distinctly that at this moment there is an agreement of amalgamation pending between the Companies—that is, between the Chartered, the South Metropolitan, the Phœnix, and ourselves. We have also entered into an agreement (it is being negotiated) with the South Metropolitan and the Phœnix. At the present moment, it does not look as if it were likely to be carried out; but it is only suspended. That is the second agreement into which we have entered. We entered into both of them unanimously, and most readily, because we conceived it to be to your interest to do what the Board of Trade thought should be done. The Board are a powerful body just now, and have great influence in the House of Commons; and it must be to the interest of gas companies to carry out their wishes in regard to the interests of the public, the consumers. Your Directors felt that in this respect your interests and those of the consumers are one. I believe I am correct in saying that the Board of Trade regret that there has been any difficulty in carrying out the arrangement for amalgamation, and that it has been suspended. I can only assure you that we have raised no obstacle, and when the proper time arrives the Directors will take it into their earnest consideration, whether it is right for them to sit quietly, and let an agreement go which we so unanimously entered into. I think we ought not readily to allow the agreement to become of no effect. Perhaps I ought not to have made these observations, the thing being inchoate, unsettled, and suspended; but after what has passed here to-day, I did not think it right the meeting should separate without distinctly understanding that there is at this moment an agreement on the subject of amalgamation. Of course you all understand that it is subject to the approval of the Board of Trade, and also subject to the approval of the Shareholders.

A SHAREHOLDER said he understood that the London Gas Company were not in the agreement.

The CHAIRMAN said they were not.

Mr. FRANKLIN thought that the subject of amalgamation was not ripe for consideration, and that any premature discussion of it would be calculated to do injury to the Shareholders.

Mr. LAYTON said he had no desire to discuss the subject, and his object was, if possible, to give confidence to the shareholders of gas companies. He had seen the electric light, and he did not think much of it. The places where it was employed would bear no comparison with the streets of London. Gas was not only useful for illumination, but for cooking and for driving engines. He had himself employed gas for an engine of considerable power, and could speak of it with great confidence. If some timid shareholders sold out, the stronger ones would be left. For himself, he saw no reason whatever for any depreciation of gas property.

Mr. FINLAY desired to repeat that, if the Company continued in existence, they must have more land, and, if that could not be obtained, amalgamation was necessary.

Mr. MAY hoped that the Engineer would give the Shareholders some information with regard to the electric light. It appeared to him that there were considerable difficulties in its application, unless the mode of producing it was very much altered. The great advantage of gas was that it could be turned on to any extent, without any attention whatever; while the electric light required a great deal of attention and care, and there was great difficulty in distributing it from its centre without an enormous amount of machinery. It was, no doubt, a very brilliant light, but in its present form it was not useful for domestic consumption.

Mr. FINLAY said it had not been his good fortune to visit Paris this year, but he had read reports of gentlemen competent to form an opinion on the subject of the electric light. Mr. Sugg's report went very fully into the matter, and that gentleman was one of the best authorities on the question. He had every confidence in the stability of gas property, and did not intend to disturb his investments in it. The electric light was not a matter to be pooh-poohed, but he did not believe it would be introduced into dwelling-houses. He was not surprised that some persons, who were not well posted in the matter, finding a scare on the market, should get frightened and part with their shares, but his advice to shareholders would be to hold on.

The CHAIRMAN moved that a dividend of 5 per cent., less income-tax for the half year ending the 30th of June last, be declared, payable on and after the 10th of October. He said he would couple that proposal with the motion for the adoption of the report.

The motion was put and unanimously adopted.

Mr. POWELL moved that the salary of the Secretary should be increased £200 a year, commencing from the 1st of July last. He said that he had had to do with the accounts for 20 years, and could, therefore, speak with confidence of the great value of the Secretary's services. He believed that he had been one of the most laborious and faithful servants that the Company ever had.

The CHAIRMAN, in putting the motion, said it was impossible that any company could have a better servant than Mr. Boddy had proved to be, and he believed that that gentleman well deserved the proposed increase of salary.

The motion was put and unanimously adopted.

Mr. BODDY thanked the meeting for this liberal acknowledgment of his services, which he said would stimulate him for the future, and lead him to devote, as hitherto, his best attention to the affairs of the Company.

Mr. ATTREE proposed a vote of thanks to the Engineer and Officers of the Company for their services during the past half year.

The motion, having beeen seconded, was unanimously adopted, and was briefly acknowledged by Mr. FINLAY.

On the motion of Mr. FRANKLIN, seconded by Mr. POCOCK, a vote of thanks was passed to the Chairman and Board of Directors for their management of affairs, which was acknowledged by the CHAIRMAN, and the proceedings ended.

COMMERCIAL GAS COMPANY.

The Half-Yearly Meeting of this Company was held on Friday last, at the City Terminus Hotel, Cannon Street—RICHARD BRADSHAW, Esq., in the chair.

The SECRETARY (Mr. E. J. Southwell) read the notice convening the meeting, and the following report and accounts were presented:—

The Directors beg to submit the accounts for the half year ended June 30, 1878.

The revenue account shows a net profit for the half year of £37,439 8s. 1d. Deducting therefrom £1625 4s. 3d. for interest on bonds and debenture stock, there remains the sum of £35,814 3s. 10d., of which, having regard to the sliding scale and the price of gas charged during the half year, the sum of £33,050 is available for dividend.

The Directors, therefore, recommend the payment of dividends after the rate of £10 10s. per cent. per annum upon the old stock, and £7 10s. per cent. per annum upon the new stock, in both cases free of income-tax, which will absorb £31,500, and, after payment of the income-tax, £526, will leave the sum of £1025 to be carried to the reserve-fund.

The balance of the net profits, £2764 3s. 10d., added to £11,000 13s. 5d. brought forward from previous accounts—together, £13,764 17s. 3d.—will be carried forward to the next half year.

The unaccepted portion of the issue of £70,000 4½ per cent. debenture stock has been sold to Proprietors by tender, and realized a premium of £1133 11s. 11d.

It is with deep regret that the Directors report the death of Mr. Lulham, one of their colleagues, who was connected with the Company from its earliest formation. The whole of the remaining Directors will retire from office, and, being eligible, offer themselves for re-election.

No. 1.—STATEMENT OF CAPITAL (STOCK) *on June* 30, 1878.

Acts of Parliament relating to the Raising of Capital.	Dividend Authorized with Gas at an Initial Price of 3s. 9d.	Paid up.	Remaining to be Paid up and Unissued.	Total Amount Authorized.
Commercial Gas Act, 15 & 16 Vict., cap. 155	10 per cent.	£450,000	..	£450,000
Rateliff Gas Act, 4 Geo. IV., cap. 98.	Ditto.	100,000	..	100,000
Commercial Gas Act, 38 & 39 Vict., cap. 200	7 per cent.	70,000	£210,000	280,000
		£620,000	£210,000	£830,000

No. 2.—STATEMENT OF LOAN CAPITAL *on June* 30, 1878.

Acts of Parliament Authorizing the Loan Capital.	Description of Loan.	Rate per Cent. of Interest.	Total Amount Borrowed.	Remaining to be Borrowed.	Total Amts. Authorized.
Rateliff Gas Act, 4 Geo. IV., cap. 98	Bonds.	5 per cent.	£14,670	£5,330	£20,000
Commercial Gas Act, 38 & 39 Vict., cap. 200 . .	Deben. stk.	4½ per cent.	69,194	210,806*	280,000
* At interest not exceeding 5 per cent.			£83,864	£216,136	£300,000

Total share capital paid up (see No. 1) £620,000
Total loan capital borrowed (see No. 2) 83,864
£703,864

No. 3.—CAPITAL ACCOUNT.

Dr.

Expenditure.			
To Expenditure to Dec. 31, 1877			£610,860 0 0
Ditto this half year on additional plant	£29,054 7 9		
Less premium on debenture stock sold by tender	1,082 4 11		
		27,972 2 10	
Balance		65,031 17 2	
		£703,864 0 0	

Cr.

—	Certified Receipts to Dec. 31, 1877.	Alterations this Half Year.	Total to June 30, 1878.
By Stock	£550,000 0 0	..	£550,000 0 0
New stock	70,000 0 0	..	70,000 0 0
Bonds	15,670 0 0	£1,000 paid off.	14,670 0 0
Debenture stock	54,547 0 0	14,647 received.	69,194 0 0
	£690,217 0 0	£13,647 received.	£703,864 0 0

No. 4.—REVENUE ACCOUNT, *for the Half Year ended June 30, 1878.*

To Manufacture of gas—			
Coals, including dues, carriage, unloading, and trimming (see Account No. 8)	£56,135 11 9		
Salaries of Engineers, Superintendents, and other officers at works	1,726 10 0		
Wages (carbonizing)	12,137 2 8		
Purification, including £941 11s. 8d. for labour	3,413 0 1		
Repairs and maintenance of plant and works, materials, and labour, less £253 10s. 2d. received for old materials	7,510 17 4		
		£80,923 1 10	
Distribution of gas—			
Salaries and wages of officers (including Rental Clerks)	£1,748 14 5		
Repairs, maintenance, and renewals of mains and service-pipes, including labour	2,169 1 2		
Repairs and renewals of meters	806 15 1		
		4,724 10 8	
Public Lamps—			
Lighting and repairing		1,872 10 2	
Rent, rates, and taxes		3,397 5 0	
Management—			
Directors allowance	£1,600 0 0		
Company's Auditors	75 0 0		
Salaries of Secretary, Accountant, and Clerks	776 12 6		
Collectors commission	1,311 11 4		
Stationery and printing	457 15 3		
General charges	422 0 11		
		4,643 0 0	
Bad debts		577 18 4	
Law charges		31 18 11	
Superannuations, &c.		333 6 8	
Official officers		78 6 4	
Total expenditure		£96,581 17 11	
Balance carried to net revenue account (No. 5)		37,439 8 1	
		£134,021 6 0	

By Sale of gas—			
Common gas, per meter, at 3s. 5d. per 1000 cubic feet	£93,942 0 3		
Public lighting and under contracts, common gas (See Statement No. 10.)	10,242 14 11		
		£104,184 15 2	
Meter-rental		2,077 4 2	
Residual products—			
Coke, less £1461 6s. 0d. for labour	£16,763 0 3		
Breeze, less £53 0s. 2d. for labour	261 16 4		
Tar	4,759 15 10		
Ammoniacal liquor, less £13 12s. for labour	5,666 0 7		
		27,450 13 0	
Miscellaneous receipts, viz.—			
Rents	£137 0 5		
Interest	171 13 3		
		308 13 8	
		£134,021 6 0	

No. 5.—PROFIT AND LOSS (NET REVENUE ACCOUNT).

Interest on bonds to June 30, 1878	£372 19 5	Balance, Dec. 31, 1877	£47,150 13 5
Interest on debenture stock to June 30, 1878	1,252 4 10	Less—	
	£1,625 4 3	Dividend to Dec. 31, 1877	£31,500 0 0
Balance available for dividend carried to balance-sheet	46,814 17 3	Forfeiture	400 0 0
		Income-tax	393 15 0
		Reserve-fund	756 5 0
		Amnt. available for dividend	£33,050 0 0
		Insurance-fund	3,100 0 0
			36,150 0 0
			£11,000 13 5
		Balance from profit and loss account	37,439 8 1
	£48,440 1 6		£48,440 1 6

No. 6.—RESERVE-FUND.

Balance on June 30, 1878	£28,075 12 1	Balance on Dec. 31, 1877	£26,912 6 6
		Dividends received	£407 0 7
		Balance of amount available for dividend	756 5 0
			1,163 5 7
	£28,075 12 1		£28,075 12 1

No. 7.—INSURANCE-FUND.

Balance on June 30, 1878	£3,100 0 0	Amount from profit and loss (net revenue) account	£3,100 0 0
	£3,100 0 0		£3,100 0 0

No. 8.—STATEMENT OF COALS.

Description of Coal.	In Store, Dec. 31, 1877.	Received during the Half Year.	Carbonized during the Half Year.	In Store, June 30, 1878.
	Tons.	Tons.	Tons.	Tons.
Common	13,533	53,959½	62,137½	5,355
Cannel	1,373	5,089¼	4,862¼	1,600
	14,906	59,049	67,000	6,955

No. 9.—STATEMENT OF RESIDUAL PRODUCTS.

	In Store, Dec. 31, 1877.	Made during the Half Year.	Used during the Half Year.	Sold during the Half Year.	In Store, June 30, 1878.
Coke . Chaldrons of 36 bushels.	2,800	63,961	19,261	47,300	200
Breeze do. 36 do.	700	6,772	..	7,372	100
Tar . Gallons	122,750	592,523	..	595,273	120,000
Ammoniacal liquor—Butts of 108 gallons	630	18,917¼	..	19,107¼	440

No. 10.—STATEMENT OF GAS MADE, SOLD, &c.

Description of Gas.	Quantity Made. Meter Register.	Quantity Sold.			Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lamps.
		Public Lights and under Contracts (estimated).	Private Lights (per Meter).	Total Quantity Sold.				
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	670,461	47,545	550,183	597,728	6,705	604,433	66,028	4,754

BALANCE-SHEET.

To Capital—			
For balance, per account No. 3			£65,031 17 2
Net revenue—			
For balance, per account No. 5			46,814 17 3
Reserve-fund—			
For balance, per account No. 6			28,075 12 1
Insurance-fund—			
For balance, per account No. 7			3,100 0 0
Unclaimed dividends			1,158 1 11
Deposits			8,241 3 0
Interest on bonds and debenture stocks			400 19 6
Sundry tradesmen and others for amounts due for coals, stores, and sundries			9,477 15 9
			£162,300 6 8

By Cash at bankers			£68,202 6 7
Ditto in hand for current expenditure			750 0 0
Amount invested			31,175 12 1
Stores on hand—			
Coals	£7,252 0 0		
Coke	82 10 0		
Tar and ammoniacal liquor	863 0 0		
Sundries	3,002 4 6		
		11,199 14 6	
Accounts due to the Company—			
Gas-rental, quarter ending June 30, 1878	£39,956 14 2		
Arrears outstanding	2,480 10 9		
		42,437 4 11	
For coke and other residual products	£8,304 9 10		
For sundries	230 18 9		
		8,535 8 7	
		£162,300 6 8	

The CHAIRMAN: I have now to propose that the report and accounts be received, adopted, and entered on the minutes. Since last we met in this room we have lost one of our colleagues—our friend Mr. Lulham, whose death is referred to in the report. He was one of our oldest Directors, and had been long connected with the Company. I think his connection with it commenced with its formation. I have always understood that he rendered great services to the Company when it was struggling with difficulties. Before it obtained its Act of Parliament, it had very great difficulties to contend with, and Mr. Lulham was of very great use in furthering the interests of the Company. The Directors have passed a resolution

expressing their appreciation of the services he has rendered, and also their sympathy with his widow and family, and that, I am sure, is a course which will meet with the unanimous approval of the Shareholders. Gentlemen, I think you will agree with me that the accounts we present to you to-day are most satisfactory. I will only allude to one or two items. The first is the gas-rental, which, for the half year ending June last, amounted to £106,261 19s. 4d., against £104,980 in the corresponding period of last year. But then the price was 3s. 9d. per 1000 feet, whereas during last half year it was only 3s. 5d.; so that with a smaller charge for gas we had an increase in the rental. The net profit is also satisfactory, for in the one account, ending June, 1878, it amounted to £37,439, while in the account ending June, 1877, it was only £31,236. That result was arrived at by a large increase in the consumption of gas. In the half year ending June, 1877, the total quantity of gas sold was 550 millions, and in the half year ending June, 1878, it was 597 millions, showing an increase of 47 millions for the half year, or about 1¾ millions per week. That, I think, is a very satisfactory state of things. I do not know that I need trouble you with any remarks on the balance-sheet, except as to one item. I notice in one of the morning papers the following statement, in an article in which our report is alluded to:—"In common with other Metropolitan Gas Companies, whose reports and accounts have at different periods been noticed in these columns, the above Company was on the 30th of June owed a large sum of money by the public; this debt was no less than £42,437, £39,956 being for gas-rental during the quarter ending with the half year, and £2480 for arrears outstanding." Now, I think it was somewhat a mistake to call this a sum owing by the public; it was the gas-rental which was due up to the 30th of June; we could not ask any one to pay up until the next day—the 1st of July—because it was not owing till then. It was, in fact, the rental for the current quarter. As soon as a quarter is ended the accounts are made up, the books are placed in the hands of the collectors, and it is their business to go round and collect the amounts due. I have the pleasure of telling you that that sum—£39,956—has now all been paid, with the exception of £933; and with regard to the arrears outstanding—£2480—it has all been collected with the exception of £954. The result is that with an annual rental of £215,532 we have only outstanding £1800. I think that is a very satisfactory state of things. I should like to say a word or two about the new works at Bromley. I had the opportunity yesterday, in company with the Engineer, of spending four or five hours in going over those works. They are substantially completed; they are now in operation, and we are making gas there. We are not as yet distributing gas in the district, but gas is being made on the works. I should like the Shareholders to see the works for themselves. We shall be happy to see them there whenever they like to come. You will find that the works are built very solidly and substantially, that no money has been wasted in unnecessary ornamentation—that the works have been built not for ornament, but for use. You will find that the works already completed are capable of making 1¾ million feet of gas per day, and, with a very small additional outlay, the amount could be increased to 3½ millions per day. The retort-house is built up to that power; the purifying power is rather in excess of that; the gasholder will hold 1¼ millions, which is equal to a manufacturing power of about 2 millions. Then I have something else to say, which is very satisfactory—that is, that the cost of the works scarcely exceeds the original estimates. This is very creditable to the Engineers. The sum put down for the erection of the works, in the estimate presented to Parliament, was £110,000, and I think, in round numbers, the cost will be about £113,000. The additional £3000 is represented by additional retorts. The £110,000, if I recollect rightly, was based on an estimate of making 1½ millions or 1¾ millions a day; with the additional £3000 we shall be able to make 3½ millions a day. I do not think that I need detain you any longer upon the accounts; but there is one matter which I may take it you are all very anxious to hear something about—I mean the electric light. I presume it is owing to that that we have so large an assembly here to-day. Your Directors have thought that you ought to have every possible information upon this subject. It is no use shutting our eyes, and waiting till we find a beautiful light all perfected taking us by surprise. We directed our Engineer, Mr. Robert Jones, to report to us on the subject, and we authorized him to obtain the services of a gentleman (Mr. Sprague) who is a very well-known electrician, and very competent to form an opinion upon the subject. Mr. Jones proceeded to Paris, where he met Mr. Sprague, and thoroughly investigated the matter. Both of these gentlemen have written very able reports, and I do not think that I can do better than read them. [These reports will be found on pages 534–535.] I may add that I went to Paris myself, and met Mr. Jones and Mr. Sprague there, and I can say that they took every possible means to obtain information with respect to this light. I can corroborate their statement of facts; but, of course, it is useless for me to express any opinion about the electric light, as I am not a scientific person. I may, however, say that I was very much disappointed with the light when I saw it. From what I had heard of it, I thought it would be a very much better and more effective light than it is. It is a kind of moonlight. Mr. Sprague, in his report, has alluded to one fact, of which I can speak. We were going together down the Avenue de l'Opéra, and I saw there a very large shop with a single plate-glass window. That shop was situated immediately opposite one of the electric lights—the light, in fact, was in front of the centre of the window; and you would have imagined that the occupier of the shop would not have wanted to put lights in his window; but the fact was he did not dispense with a single light—every gas-burner there was lighted, and I did not observe anything of the yellow appearance of the gas of which we have heard—there was no effect of the kind; the shop was lighted entirely by the gas. There is no doubt there is a place for the electric light, and I was struck with it in the courtyard of the Louvre Hotel. That is a place which is exceptionally favourable for it. It is a large yard surrounded on all sides by high walls, entirely white, and roofed in. There the light is perfect, and I should think, if any persons could work it cheaply, they could there. They are obliged to have an engine for other purposes—to work their lift, and so on—and it is no doubt available to turn the electric machine. I went with Mr. Jones to the Hippodrome, but I did not think the light effective there. There is a leading article in *The Times* this morning on the subject of gas property, and there is also a good letter from an engineer upon the same subject. I invite your attention to both the article and the letter. All I can say is that your Directors have every confidence, notwithstanding the electric light, that we shall have the pleasure of meeting you half year by half year for many years to come, and that our reports will be as favourable as that which we present to you to-day. I beg now to move that the report and accounts be received, adopted, and entered on the minutes.

Mr. Samuda, M.P., seconded the motion, which was unanimously agreed to.

The Chairman moved that, pursuant to the recommendation of the Board of Directors, a dividend be declared for the half year ending June 30, 1878, at the rate of 10½ per cent. per annum upon the old stock, and 7½ per cent. per annum on the new stock, both free of income-tax, and that the balance of £1025, after the payment of income-tax, be carried to the reserve-fund.

The motion was seconded, and unanimously adopted.

The Chairman said that the next matter was the retirement of the Directors. He did not think it was necessary to enter into an explanation of the whole matter; but the fact was that there was a doubt whether the Board should go out of office or not. They had thought that they would take the more prudent course, and all retire. They now ceased to be Directors, and the matter was left in the hands of the Shareholders.

Mr. Rawlinson said he had great pleasure in moving the re-election of the retiring Directors.

Dr. Liddle seconded the motion, which was passed unanimously.

The Chairman thanked the Shareholders for their renewed confidence, and promised that the best endeavours of the Directors should be devoted to the promotion of the interests of the Company.

Mr. Hollington said he observed that the Company had been fined in the previous half year £400, and again during the last half year £250. He was afraid that an impression would be created that the public were paying for what they did not get.

The Chairman said that the Engineer would be able to give an explanation on that point.

Mr. Jones said that, instead of the public paying for what they did not get, they really received more than they ought to have. The Company were fined in the first instance for excess of ammonia. The process of purification under which they were then working was comparatively new to the whole of the staff. It was impossible for the Engineers always to be present, and difficulties occasionally arose, not through any neglect of the officers or the men, but from pure misadventure, and circumstances which could not be foreseen. If the Engineers could have foreseen what had happened, they would, of course, have taken every precaution to prevent it. The last fine was for excess of sulphur over 20 grains. The Metropolitan Board of Works proceeded under the new Act, because they said it was imperative, and upon one day the Company were only half a grain above the standard. The highest they had ever been above the standard was six grains. The six grains in 100 cubic feet would have to be compared with the whole weight of the 100 cubic feet of gas, which would be 23,300 grains. At present the sulphur maximum was raised from 20 to 25 grains. The consumers suffered nothing; no chemist would say that the consumers suffered in the least. In the investigation before the Committee of the House of Commons last year, Mr. T. W. Keates, the Chemist of the Metropolitan Board, stated that he should have no objection to allow 30 or 33 grains in 100 cubic feet. The Referees fixed the standard at 20 grains, and the Company were fined for 26. With regard to ammonia, no chemist in the world would say that 10 or 12 grains would be injurious. He had heard Dr. Letheby say, before a Committee of the House of Commons, that the amount allowed should be 5 grains, and 5 grains was the amount fixed in the Metropolis Gas Act of 1860. Dr. Letheby said, "I make very light of ammonia." Still the Referees had fixed the amount at 2½ grains, and the Company were fined for going beyond that amount. He only mentioned these matters to show that the consumers suffered nothing from the excess of sulphur and ammonia, for which the Company had been fined. He also wished to call attention to the fact that the first Company started under the new Act, which now included nearly all the Companies on the Middlesex side of the Thames, were not fined for eight years, while working under the new process. There was no doubt that other Companies had frequently been liable to a fine, but had not been fined. The Commercial Company, who were almost the pet of the Metropolitan Board, they having accepted their terms, had been victimized as much as possible. It was impossible for them to foresee what had occurred; otherwise they would have prevented it by every means in their power. They believed that they now knew more of the new process, and would be able to work it satisfactorily, and he hoped that the last fine really would be the last. He might add that what most affected the consumer was the illuminating power. The standard in the Commercial Act was 16 candles, and during the period over which the fine was incurred the illuminating power was 17½ candles. The returns of the Gas Examiners would show that the illuminating power was always much in excess of the standard.

Mr. Livesey said that Mr. Jones might have stated that the Referees had, in their Winter Instructions just issued, altered the maximum for ammonia from 2½ to 4 grains.

The Chairman proposed a vote of thanks to the Engineers and other Officers of the Company for the great ability with which they had managed the affairs of the Company during the past half year.

The motion was seconded and agreed to unanimously.

Mr. Jones, in acknowledging the vote, said that the Officers of the Company felt the great responsibility resting upon them, and they would be encouraged by the good feeling of the Proprietors to discharge their duties to the best of their ability.

Dr. Liddle moved, and Mr. Rawlinson seconded, a vote of thanks to the Chairman and Directors for their able management of the Company's affairs.

The Chairman said that the thanks of the Proprietors were always highly appreciated, and promised that their interests should be carefully studied by the Board.

The proceedings then terminated.

SHEFFIELD UNITED GASLIGHT COMPANY.

The Half-Yearly Ordinary General Meeting of this Company was held on Tuesday last, the 1st inst.—the Mayor (F. T. Mappin, Esq.) in the chair.

The following report and accounts were presented:—

The amount standing to the credit of revenue on the 30th of June last was £46,523 17s. 2d., but such sum included a balance of £14,817 17s. 11d. carried over from the previous half year.

Your Directors recommend the payment, for the half year ending the 30th of June last, of the maximum dividend.

Such dividend will be as under—

Dividend on £135,000 class A stock, after the rate of £10 per cent. per annum	£6,750 0 0
Dividend on £209,053 10s. class B stock, after the rate of £10 per cent. per annum	10,452 13 6
Dividend on £99,700 class C stock, after the rate of £10 per cent. per annum	4,985 0 0
Dividend on 12,937 new ordinary £10 shares (second issue), £4 per share paid up, after the rate of £10 per cent. per annum, being 4s. per share, or	2,587 8 0
Total	£24,775 1 6

Your Directors suggest that the sum of £6930 17s. 9d., being the balance of the net profit on the half year's operations, which will remain after the payment of the above dividend, shall be added to the reserve-fund, and that there shall be carried to the credit of the half year now current the same sum as was carried over at Christmas, 1877—viz., £14,817 17s. 11d. The reserve-fund will then amount to £60,857 17s. 10d.

The low price of coal, the increase in the consumption of gas, and the excellent condition of the Company's works, have justified your Board in making a still further reduction in the Company's charges for gas, which, from the 1st of July last, are 2s. 3d., 2s. 5d., and 2s. 7d. per 1000 cubic feet, according to the consumption.

Your Board regret the decease of the late Mr. John Watson, who has ever since the year 1864 been the Auditor of the Company's accounts. His appointment annually by the Corporation for a period of 13 consecutive years proves that he has discharged his

duties to the satisfaction of that body; and your Board can testify that he has, at the same time, fulfilled them with great efficiency and urbanity.

The accounts now submitted to you have been officially audited by Mr. William Henry Watson, who has since been appointed by the Corporation as successor to his deceased father.

Since the last meeting, the Company's mains have been extended to Chapeltown, High Green, and Burn Cross.

The new tank at Neepsend has, since the last meeting of Shareholders, been found to be perfectly sound and water-tight, and it and the gasholder placed therein are now in use.

The three elected Directors, who retire by rotation, are Messrs. Ebenezer Hall, Horace Walker, and Henry Stephenson. They are all eligible, and offer themselves for re-election.

Dr. *Capital Account, for the Half Year ending June 30, 1878.* Cr.

Class A stock, fully paid up	£135,000	0	0	Land, buildings, parliamentary, and other expenses, works, and machinery (including mains to June 30, 1855)	£429,928	19	5½
Ditto B do. do.	209,053	10	0	Mains from June 30, 1855	74,669	1	5
Ditto C do. do.	99,700	0	0	Meters	30,413	14	8
12,937 new ordinary £10 shares (2nd issue), £4 per share paid up	51,748	0	0				
Amount raised on mortgage £39,400							
Less, paid off since 1,000	38,400	0	0				
Balance	1,110	5	6½				
	£535,011	15	6½		£535,011	15	6½

Revenue Account.

Balance brought from last account	£14,817	17	11	Half year's expenditure in the production of gas	£50,081	17	8
Half year's gas and meter rents, due this day	58,575	15	5	Paid mortgagees & bankers for interest during the half year	575	1	10
Amount arising from the sale of coke, tar, waste lime, and ammonia water	17,884	14	3	Balance	46,523	17	2
Amount realized from the manufacture of sulphate of ammonia, sale of gas fittings, and work done (after deducting all charges) and house and other rents	5,902	9	1				
	£97,180	16	8		£97,180	16	8
				Dividends payable Oct. 9, 1878	£24,775	1	6
				Balance to be carried to reserve-fund	6,930	17	9
				Balance to be carried forward	14,817	17	11
Balance brought down	£46,523	17	2		£46,523	17	2

Maximum price of gas for the half year, 2s. 9d. per 1000 feet.

General Balance.

Balance of revenue account	£46,523	17	2	Ledger balances, and accounts owing to the Company	£35,651	14	0½
Ledger balances, and accounts owing by the Company	42,945	13	10	Stores in hand	15,071	17	5
				Balance due from bankers	37,634	5	10
				Balance due from cashier	1	8	2
				Balance of capital account	1,110	5	6½
	£89,469	11	0		£89,469	11	0

Reserve-fund, invested Dec. 31, 1877 . . £52,832 2 8
Interest to June 30, 1878 . . . . . 1,094 17 5
£53,927 0 1

The Chairman: Gentlemen, when we last met, your Directors were about considering the propriety of reducing the price of gas, and also of converting the mortgage capital into share capital. Those two propositions have been carried out, as you all know, by the shares which have been granted to you—£8 10s. for every £50; and the price of gas has been reduced from the 1st of July; the highest price now being 2s. 7d. per 1000 feet, 2s. 5d. after the first 5000 feet, and the lowest price 2s. 3d. per 1000 feet. The amount standing to the credit of the revenue account at the close of the past half year was £46,523 17s. 2d.; deducting the balance which was carried forward—£14,817 17s. 11d.—the net profit made during the past half year was £31,705 19s. 3d. To pay our maximum dividend of 10 per cent. upon all shares paid up, it requires £24,775 1s. 6d., leaving a balance of £6930 17s. 9d., which your Directors decided to carry to the reserve-fund, which will then stand at £60,857 17s. 10d. You also carry a balance forward of £14,817 17s. 11d. to the present half year's account. Well, gentlemen, I think we have cause to be satisfied with the work for the past half year. The profit has been somewhat made from the reduced price of coals, and carriage on the same, amounting to £2626 19s. 8d., and the large sum less for repairing retorts of £1487 13s. 1d. I may tell you that the reduction in the price of gas during the half year caused us to receive less by £2823 19s. 7d., and our dividends for the half year are more by £1339 8s. 1d. Our expenditure upon capital has been a large one, principally in completing the gasholder and tank, and in enlarging many of the mains throughout the town. The new gasholder and tank, capable of storing 1,800,000 cubic feet, I am glad to say, has been filled, and is in proper order, as you all know, and has been a satisfactory work. The produce of gas per ton of coals has influenced the profits during the past half year. We have been able to obtain 370 feet per ton of coals for the half year in excess of what we did in the same period of 1877. And the increase per man during the half year, during the 24 hours, has been 1818 cubic feet; so that this will, during the half year when we are making a large quantity of gas, have a considerable effect upon the profit. Our loss by leakage is somewhat more than during the preceding half year—8·50 per cent.—and in the corresponding half year it was 9·28 per cent., but in the intervening half—the last half of 1877—the loss was only 7·08 per cent. Well, gentlemen, I do not know that I have very much to say to you further upon the working of the Company. It has been conducted satisfactorily to us as Directors, and I think you, as Shareholders, will admit that it has also been conducted satisfactorily to you. Your Directors have had the subject of lighting by electricity more or less before them. They decided not to introduce it into the report, but to leave it for any observations that I might think well to make upon it at this meeting. Twelve months ago I gave you an opinion, which was founded upon the information and the facts that I had been able to glean, and so far as I could learn from different sources, and I have never seen any reason to alter my opinion since that time. I said there was one great objection to electric light, and that was the heat which it produces. Now, I am informed that this is not a fact; that the heat is not an objectionable part of it. Those of you who have been in Paris during the last few months must have been very much delighted to see the effect of the experiments, and the applications that they have made there with the electric light, and, whatever may be said against it, I think it will come into use to a considerable extent. What I am about to say, gentlemen, I hope you will only take as my opinion. It is not the opinion of the Board in any way. It is an opinion of my own, formed from the best information I could obtain, and I think it right that you should have, and be in possession of, all the information that your Chairman or the Directors have, which will enable you to form your own opinions. Speaking of the electric light, they have applied it in Paris to the lighting of the streets, the lighting of the Orangery in the garden of the Tuileries, in the Magasins du Louvre, and other places. In some parts of France they have employed it in weaving-sheds, and altogether it is pretty extensively used there. But one great difficulty you will, no doubt, have observed is, that the light is not steady or regular, and they have appliances to light those places with gas when the electric light goes out. In Paris, I think they turn it out somewhere about midnight, and use gas afterwards. I have also seen parts of the Boulevard de l'Europe lighted with electric lamps one night, and the next night they have had no lights in them. The light, it appears to me, would be very prejudicial to the eyesight. It is necessary, where I have seen it used, to have two glass globes over it to protect it, and reduce the quantity of light, so that you can look upon it without being dazed or dazzled by it. The engine that is required to work it I believe will not carry the electric power beyond 150 yards; so that at every 300 yards they must have a steam-engine to work it. Mr. G. H. Stayton, C.E., Surveyor to the Chelsea Vestry, was instructed to inquire into the electric light, and report to the Vestry, which he did. He states that one machine, actuated by a 16-horse power engine, is required for every 16 lamps, and its cost far exceeds that of gas. He instances Sloane Street as an illustration. The cost would be as follows:—He thinks that it would require 32 lamps and two electric stations to light that street. The cost of these, and the alteration of the lamp-columns and conducting apparatus, would amount to £32,000. The cost of maintenance he calculates at 16s. per hour, and 3250 hours consumption per annum would be required; and the annual cost would be £2600 per year, whereas the present cost of lighting by 40 lamps is £133 3s. 4d. Then I have a report from Mr. Cotton, the Engineer of the Dublin Gas Company. He says: "We have carried out experiments with the electric light, and have the best authority for saying that there is nothing in it to interfere with gas interests." The Governor of The Gaslight and Coke Company in London states that they have employed Mr. Sugg, whom the Engineer to this Company (Mr. T. Roberts) has seen. Mr. Sugg, in the report he has made, states that he was in Paris at the late National *Fête* there, and the electric light was quite overpowered by the oil lamps and gas-jets. He thinks on account of the electric light giving out no volume of light, the colour is of a bluish white, which for many purposes is most objectionable. He also states that when he came out of the place where the electric light was produced, he could scarcely see his way for some time, and was some minutes before he regained his proper vision. He also finds this, which all who have gone into it and inquired about it have found, and that is about the cost. He says the cost of carbon, attendance, motive power, is in great obscurity. He could obtain no answer on any of these points. But, gentlemen, we must not look at one side of this thing. We must look at the advantages of it, and we must also look at the disadvantages. There is one thing, it does not vitiate the air, it gives off no noxious vapours, it produces little heat, and another matter is that it involves no risk of explosions. These are some advantages, and I believe considerable advantages, in its favour. There is another gentleman who reports in this way. M. Fontaine, lecturing on the electric light before the Institute of Mechanical Engineers, states that in 1874 there were only four applications of this light in France; but this year there are more than 500 of them. But he states at the same time that he thinks gas companies have little to fear from the electric light, so far as their pecuniary interests are concerned. He states that in a large weaving-shed at Rouen the proprietor employed six Gramme machines worked by steam power, and he told him that the saving to him in the year by the electric light over gas was £57 3s. Still, gentlemen, you must bear this important matter in mind, that he calculated upon the price that he was paying for gas, which was 7s. per 1000 cubic feet. So that with gas at the price that it is in London (3s. 6d. or 3s. 9d.), and the price that we supply it at in Sheffield (2s. 3d., 2s. 5d., and 2s. 7d. per 1000 cubic feet), my opinion is that we are in a very favourable state and position in regard to it. There is another matter that is an important feature in your undertaking. In electric light you obtain no residuals; gas, on the contrary, produces a number of them. Ammoniacal liquor and tar have become almost indispensable, and since Peruvian guano is not imported—and there is very little imported—ammoniacal liquor is a necessity to supply the sulphate of ammonia which has now become so generally used in agriculture. If less gas is produced there will be less residuals, and if the demand keeps up, the residuals—which are a large source of profit to gas companies who sell them—must increase in price. I am of opinion that these two lights are very valuable to the community, and that both gas light and the electric light have separate spheres. For my part, I think that gas companies will have seriously to enter into the supply of it if they have not already begun to do so—to enter into it and supply it if they have power to do so. Although they may not be able to afford it at the price at which they supply the other light, depend upon it that for many purposes and many places the public will have it, although they have to pay more in price for it. This, gentlemen, I hope you will take as my own opinion on the information that I have been able to gather. I have put it as fully before you as I think it necessary, and you must judge now for yourselves respecting your property. I believe it is a sound one and a good one, and I have pleasure in moving—"That the Directors report be approved and entered on the Company's minutes, and that a copy of the resolutions of this meeting be sent to each Shareholder."

Mr. F. E. Smith seconded the motion. He said that the Chairman had explained so fully everything in the report, that little was left for the Shareholders to say. He thought the Company were exceedingly prosperous, and that there were few companies throughout the world who were so prosperous. Their Company had always been well managed. He remembered that there was a sort of fidget about gas shares some years ago, but those who bought them then had reaped advantage upon advantage. The supply of gas was in a far better state than it would have been if the Council had obtained possession of it. At some places, where the works belonged to the town, sometimes they had been in total darkness in consequence of mismanagement. Being a shareholder in various gas companies to the amount of about £20,000, he had made it an anxious concern for the past twelve months as to the new electric light, and had had correspondence with gas engineers and other parties well up in the subject, and from all the information he had gathered he felt satisfied himself that the electric light, though it might serve in large squares and places of that kind, could never be brought into general use. The first cost for ordinary consumers was quite prohibitory, and he would strongly advise gas shareholders not to be frightened out of their property by the present scare about this new light. It well suited foreigners to bring out new inventions, but parties who held good stock like gas should be careful that they did not needlessly part with their holding during a temporary fidget. Instead of selling any of his own, he had recently bought more.

Mr. T. Waterhouse said that an engineer in Manchester told him that the electric light would cost three or four times as much as gas.

Mr. H. C. Sorby, in response to the request of one of the Shareholders, said he had made some inquiries in reference to electric lighting, and what he could learn agreed perfectly with the remarks that had been made by the various speakers who had alluded to the question. For his own part, he thought it might be safely affirmed that up to the present time nothing that was known would enable the electric light to compete with gas. No means had as yet been discovered for the purpose of re-

ducing the amount of illumination of each particular lamp used. He thought the amount was either 275 or 375—at all events, it was something like 300-candle power, which was the least illumination that could be obtained from one source of light. The distribution was a very great difficulty. There was very little reason to think that electricity would ever beat gas,although for large buildings, and in certain parts of towns, it might be used. Still, do what they would, they would invariably have to use a very considerable amount of mechanical power, and have to deal with a great many difficulties that were totally unknown in the case of gas. He did not think that the electric light would in the least degree interfere with the gas that they supplied.

The resolution was then carried unanimously.

The CHAIRMAN moved the declaration of the various dividends recommended in the report.

The proposition was seconded and carried unanimously.

The retiring Directors were re-elected, after which the meeting was brought to a conclusion with a vote of thanks to the Chairman and Directors for the very satisfactory manner in which they had managed the affairs of the Company.

SHREWSBURY GAS COMPANY.

The Annual Meeting of this Company was held on Thursday, the 26th ult.—Mr. A. G. BROOKES in the chair.

The report presented was as follows:—

The Directors have pleasure in submitting to the Shareholders a statement of accounts for the year ending June 30, 1878.

The profit and loss account shows a balance of £5920 16s. 1d. The Directors, therefore, recommend that the usual dividend be declared, after adding £2000 to the reserve-fund, and investing it in Consols.

The retort-house and coal-store, referred to in the last report, are completed. The works now in progress are four additional purifiers, purifying-house, and lime-shed, and the relaying of mains, where necessary, of a larger size.

The Bill which the Company promoted in Parliament last session, the objects of which were announced at the meeting of Proprietors in February last, passed unopposed, and received the Royal Assent in April.

At an extraordinary meeting of Shareholders, held on the 10th of May, resolutions were passed authorizing the Directors, in conformity with the 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, and 17th sections of the Shrewsbury Gas Act, 1878, to raise and issue £10,000, and the sum of £2500 upon mortgage, as prescribed in the 18th, 19th, 20th, 21st, and 22nd sections. At the public auction on the 27th of June, £3500, in 35 lots, of £100 stock, was offered for sale in pursuance of the above provisions, and realized, after deducting the expenses, £5504 1s. This sum, deducted from the £10,000 authorized to be raised, leaves a balance of £5495 19s. to be dealt with when the Directors determine. Disposing of new capital by auction or tender ensures an advantage to the consumer, as the premium obtained is not considered as part of the capital entitled to dividend, but as that which shall be expended in extending or improving the works, or in paying off money borrowed or owing on mortgage.

The financial position of the Company, attributable to the economical principles adopted, and the low price of material, warrants the Directors in lowering the price of gas to the following charges from the 1st of October:—Under 50,000 cubic feet per quarter, 3s. 4d. per 1000 cubic feet; 50,000 and under 100,000 per quarter, 3s. 2d.; 100,000 and upwards per quarter, 3s.

The retiring Directors are John Robert Humphreys and William Beacall, and one Auditor, Thomas Onions, who are eligible for re-election.

The CHAIRMAN said that the accounts which were presented were in a new form—the one prescribed by their recently obtained Act of Parliament—and it differed very considerably from the form in which they had been issued on previous occasions. It was more clear and much more satisfactory, and he thought it would be appreciated both by the Shareholders and by the public. The profit and loss account was highly satisfactory. In the face of a heavy expenditure and stagnation of trade, the Directors were enabled to present a most satisfactory balance-sheet. They had replaced £1328 0s. 9d., which was temporarily withdrawn from the reserve-fund, and they had added a further sum of £2000 to that fund, which showed the great success the Company had attained during the past year. They owed that success partly to the reduced price of coal, to judicious economy, to the enhanced value of some of their products, to the progressively increasing consumption of gas, and to the efficient state of the works, which were approaching such a condition of efficiency, that the cost of making gas was diminishing, and, with the additions in progress, he believed 50 per cent. more gas could be made with comparatively little more expense than the cost of the extra coal required. Last year they slightly reduced the price of gas, by which the smaller consumers were benefited, and they now proposed another reduction, by which they would be still further benefited. The premium realized by the sale of shares was very satisfactory. The Directors were desirous of placing the Company in such a state as to ensure the payment now and always of the authorized dividend, and that being secured, the public would reap any further benefit from the care and efficient superintendence of their Manager (Mr. S. B. Darwin), to whom they were so much indebted. It was not necessary for him to say more at present. The report spoke for itself, and he should simply move—"That the report of the Board of Directors, together with the accounts, as examined and certified by the Auditors, be received and entered on the minutes."

Mr. J. H. LEAKE seconded the motion, and it was carried.

The CHAIRMAN moved—"That a dividend for the year ending June 30 last be now declared, at an average rate of 7½ per cent. per annum in the several classes of shares, deducting the interim dividend of 3¾ per cent. paid in March last."

Mr. G. E. LEAKE seconded the motion, which was agreed to.

The retiring Directors and Auditor were re-elected.

Mr. BURR proposed—"That the cordial thanks of the meeting be given to the Directors for their able management of the affairs of the Company, and to the Chairman for his conduct in the chair." He said he was sure that every Shareholder would gladly accord a vote of thanks to those gentlemen. The present prosperity of the Company was a sufficient guarantee that everything had been well cared for and well looked into, and he was certain they were all much pleased with the results.

Mr. POOLE seconded this proposal, and it was carried with applause.

The CHAIRMAN having expressed his thanks, said the success achieved was attributable to the cordial co-operation of all the Directors in endeavouring to do all they could for the Company. Each Director paid every conceivable attention to all the details that required looking into. He might say this, however, that the labours of the Directors would have very little effect but for the able management of Mr. Darwin, and he would propose that the thanks of the meeting be accorded to Mr. Darwin, for he highly deserved it. He did not believe any Company in England were in a more efficient state than their own, and that efficiency was entirely due to Mr. Darwin's management.

Mr. BURR said he quite agreed with what the Chairman had said, and had great pleasure in seconding the proposition.

The motion having been put and carried,

Mr. DARWIN thanked the meeting, and said the officers under him all worked harmoniously together, and to that, with the exertions of the Directors, the success of the Company was attributable.

The meeting then terminated.

MEETING OF THE SOUTH METROPOLITAN GAS COMPANY.—The meeting of the South Metropolitan Company took place yesterday. A full report of the proceedings and the accounts will be published in our next issue.

EAST LONDON WATER-WORKS COMPANY.

The Half-Yearly General Assembly of the Proprietors of this Company was held at the Office, 16, St. Helen's Place, on Thursday last, the 3rd inst.—JOHN COOPE DAVIS, Esq., in the chair.

The SECRETARY (Mr. E. Bates) read the following report of the Directors, and, on the motion of the Chairman, it was adopted.

The half year's accounts to Midsummer, 1878, duly certified, are herewith submitted to the Proprietors.

The water-rates, as stated therein, amount to £101,072 7s. 4d.; for the corresponding half year in 1877 the amount was £95,310 16s. 2d.

The expenses of maintenance and management in the present accounts amount to £39,260 8s. 11d.; in 1877 the corresponding amount was £39,427 2s. 7d.

The expenditure on capital account during the half year was £9783 0s. 7d., from which must be deducted £4950, the purchase-money for the tolls of Chingford Mill and Hillier's Ferry Bridge, as stated in the last report. The balance of unexpended capital now amounts to £15,320 7s. 2d.

The water-tower at Buckhurst Hill is nearly completed.

The repair of the river wall at Old Ford has been postponed, as there appears some probability of improvements taking place in the river, which may, to some extent, change the line of the wharfage; all the other works of the Company are in good order.

Progress is being made in carrying out the notices for a large extension of constant supply in the Company's district referred to in the last report.

The quantity of water pumped during the half year was 4,801,378,588 gallons, being an increase of 258 millions over the quantity reported for 1877.

The two Bills introduced into Parliament last session by the Metropolitan Board of Works did not reach a Committee, but the Companies have been subjected to heavy expenses in protecting their interests.

A Bill promoted by the Thames Conservancy has become law; this will increase the half-yearly payment by this Company from £750 to £1000 on Dec. 25, 1878, instead of its being raised to that amount on Jan. 1, 1881. The only advantage given to the Companies is the removal of the restriction laid by previous Acts of Parliament upon the sale of water by one Company to another.

In consequence of the continued large increased demand in the Essex part of the Company's district, the Directors have resolved, after mature consideration, to construct additional filter-beds at Lea Bridge, and erect steam power there, specially to raise the water to the high levels of the neighbourhood. The estimates for these works amount to about £50,000. Additional capital will be required next year to meet this amount.

The Directors regret to record the death of their esteemed friend and colleague, Wm. Liddiard, Esq., who has had a seat at the Board during eleven years, and who from 1871 occupied the chair of the Company. A new Director will this day be elected in his place.

The Directors recommend that a dividend at the rate of 6 per cent. per annum on the ordinary stock, and of 4½ per cent. per annum on the debenture stock, both clear of income-tax, be declared payable on the 10th of January next, in the usual manner.

Dr.—REVENUE ACCOUNT, FOR THE HALF YEAR ENDING JUNE 24, 1878.

Maintenance.			
To Maintenance and repair of impounding and service reservoirs, works, and pipes, for obtaining and storing of water, including the cost of materials and labour	£2,001 5 2		
Maintenance and repair of mains, pipes, fittings, meters, and works connected with distribution of water, including the cost of materials, labour, and renewals	3,457 11 4		
Pumping and engine charges, including the cost of coals, wages, &c.	6,538 14 1		
Filtration, including the cost of materials and labour	1,884 16 9		
Salaries of Engineer and Clerks, and wages of Inspectors and Turncocks	4,484 14 8		
Rents of houses and lands, accrued due to date, and owing by the Company	768 8 6		
Abstraction of water—Thames, Lea, and New River Company	2,836 13 4		
Rates and taxes, exclusive of income-tax	10,201 3 0		£32,223 4 10
Management.			
Allowance to Directors	£1,067 10 0		
Allowance to Company's Auditors	21 7 0		
Salaries of Secretary, Accountant, and Office Clerks	1,250 16 1		
Superannuation of servants of the Company	579 4 8		
Commission to Collectors	3,004 5 3		
General establishment charges	1,011 8 4		
Official Auditor and Water Examiner	102 12 9		
		7,037 4 1	
Dividend and interest account for transfer of profits		59,108 12 5	
Balance carried to next account, to provide for losses		4,500 0 0	
		£102,869 1 4	

Cr.—REVENUE ACCOUNT.

By Balance brought from former account	£4,500 0 0		
Less sums written off as losses, viz.—			
Empty houses, houses cut off, and bad debts	1,822 7 0		
	£2,677 13 0		
Water-rates accrued to June 24, 1878	98,394 14 4		
		£101,072 7 4	
Rents of houses and lands accrued to date, and owing to the Company		1,091 14 0	
Fees received for registration of shares, transfers, &c.		16 0 0	
Charges for laying on water		689 0 0	
		£102,869 1 4	

STATE AND PROGRESS OF ELECTRIC LIGHTING IN PARIS.

At the Meeting of the Commercial Gas Company last Friday, reports were submitted by the Engineer of the Company (Mr. Robert Jones) and by Mr. John T. Sprague, Member of the Society of Telegraphic Engineers.

The report of Mr. Robert Jones is as follows:—

The Commercial Gas Company,
Ben Jonson Road, Stepney, E.,
October, 1878.

To the Directors of the Commercial Gas Company.

Gentlemen,—In pursuance of the instructions given me on the 13th ult., I have made an investigation of the modes of electric lighting as at present in operation in Paris and London, and have availed myself of the assistance of Mr. J. T. Sprague, the electrician, whom the Board authorized me to retain, whose report is appended.

In furtherance of this view I have spent some eight days in Paris, and have gone through a large amount of matter and detail. With the time available since my return it is impossible to do more than formularize the facts obtained, and to briefly give the most salient of the conclusions I have come to—

First, in the nature and quality of the lighting.

Second, in its commercial aspect as touching any dangerous rivalry to gas lighting.

I have adopted throughout the statements of the promoters of the schemes, as no means whatever are afforded by the parties for determining the facts, those especially of the current cost of maintaining the lights being, as it seemed to me, studiously withheld. But in accepting these statements, it is obvious that the usual bias, even of candid inventors, must be allowed for, especially as no one is in a position to contest them.

As to the efficiency and quality of the light, I think it may be conceded that on both the systems (Jablochkoff and Lontin) the single subdivided lamp is equal, when directed on the screen of a photometer, without the intervention of any glass shade, to, say, 600 sperm candles—such as are the standard in England—but at any considerable range, unless a reflector

is used, and a translucent lens to concentrate and project a beam of light, I am of opinion that less than half this effect is obtained; in other words, the volume of light, scattered equally around the centre of illumination for any extent of area, is very much below the photometric power at short range. Beyond this the use of the opaline shades discounts the illuminating value by the commonly accepted ratio of 60 per cent. The difference in power between the diffused light from a shaded lamp and the projected beam of a reflected lamp, through clear lenses, is not likely to strike the casual observer; but when thrown into comparison, as I observed them at the great Hippodrome in Paris, the effect is most marked. That the effect in diffused light is much below the photometric value of the naked light is further evidenced by the fact that there are 34 lamps within the limited space of the Avenue de l'Opéra, which corresponds, in London street-lighting, to a space usually fitted with about 50 lamps of, say, about 10 candles each—*i.e.*, 34 lamps at 600 candles = 20,400 candles, against 50 lamps at 10 candles = 500 candles—but there was certainly nothing like such a comparative effect as this, although, of course, the place was splendidly lighted. I am rivetted in the belief that, powerful as the light admittedly is, its effective value is very much below that assigned to it.

With regard to the distribution of the lamps in reference to the position of the motive power, I observed that in no case, in either of the systems, were the lamps placed beyond a distance of 200 yards from the engine; and, as it has been stated without contradiction that beyond this range there is a considerable loss of intensity in the current, I take this state of things to be a significant corroboration of the statement, as it would be the easiest thing in the world for the promoters to insert a longer cable and settle the question if it were not so. If this be so, it forms, perhaps, the most formidable difficulty in the way of establishing the system for general purposes.

In all systems the lamps have to be visited at intervals of a few hours to fix fresh carbons. In Jablochkoff's lamps the light is maintained, at this time, by a duplex arrangement; in the others the light has to be extinguished.

With regard to the possible competition with gas, in the case of a district where an established supply at a low price exists, as in that of this Company, I have come to the deliberate conviction that, in its present form, its sphere is exceedingly limited; though to that limited extent I would not deny it a place, provided the economy of it is at all what the promoters state. Its field might be outdoor lighting, in long, straight streets of considerable width, and in large halls free from partitions and galleries, where the current expenses of attendance, &c., in a separate establishment would not bear too high a proportion to the amount of light required. But the main bulk of the gas consumers in the Metropolis would be such as have a five-light gas-meter, and use perhaps seven lights in a ten-roomed house, fitted as a shop.

These people have a vested interest in the present mode of lighting, as the gas-fittings will have cost them several pounds; moreover, many of their lights are only occasionally used, and others are small lights in passages, closets, &c., where, at the very smallest expense—perhaps not 2s. 6d. a year—the place is adequately lighted for their purpose. To offer to such a man, with no larger single chamber in his house than his shop, of 20 feet by 15 feet area, a light, however magnificent, which involves a new installation and an illuminating effect ridiculously in excess of his wants, and in the smaller lights, necessarily more expensive, even if all costs but that of the carbons consumed be estimated, saddled with the necessity that, either by himself or in concert with his neighbours, he shall set aside part of his premises, and establish therein an engine and boiler-house filled with suitable machinery, which, at the acknowledged minimum rate of one-horse power per light, would mean no inconsiderable matter both in room and expense; to tell him he must employ a qualified stoker for the hours of illumination, and, further, that he must maintain the wear and tear of all this machinery, and settle with the insurance office on the head of his putting up a steam furnace also, could provoke but one answer: "The light I have answers my purpose, and I can cheaply add to it. I can afford neither the room, the time, nor the cost involved in the change."

I have selected this illustration to show the immediate objections of a solid practical kind which intervene between this otherwise attractive and imposing light and the ordinary gas consumer, because it is only by putting aside the glamour of the first impression made by the power and intensity of the new light, and looking at it from the bare dry view of how to make it available in ordinary cases, that its true position in competition is to be seen.

I have to add, in conclusion, that, having given this question my most careful consideration, I am led to the belief that the new light is entirely unsuited for shops and private houses, not only on account of the complex and costly machinery necessary for its production, but because of its greater cost as compared with gas. That it will eventually occupy a place in the whole system of lighting I have no doubt whatever, but it will be of such a limited extent as not in any appreciable degree to affect or interfere with the financial interests or prosperity of Gas Companies.

(Signed) ROBERT JONES,
Engineer-in-Chief, Commercial Gas Company.

The following is the report of Mr. John T. Sprague :—

To the Directors of the Commercial Gas Company.

Gentlemen,—I have at your request visited Paris, in order to examine into the present state and progress of electric lighting, with its probable bearing upon the future of gas lighting; and in reporting to you thereon, I propose to treat the subject under three heads—

I. The actual facts—the endeavours made, and the degree of success attained, in producing light by electricity.
II. The relative cost of such light, as compared with gas lighting.
III. The influence likely to be exerted on the gas interests.

I.—*Uses.*

There are at present displayed in Paris a great number of electric lights, but they may be studied in a very simple set of groups, based upon the purposes for which they are used. This also happens to properly distribute the different systems in operation.

There are at present two such systems:—that of M. Lontin, in which the ordinary form of electric burner (to use a gas term, as most convenient) is employed; the novelty being in the machine generating the electric current and distributing it to the burners. This is the same system as is used at the Gaiety Theatre in the Strand. It would be useless to attempt to give now a description of the apparatus used, as this would occupy too much time, but I purpose doing it fully in a publication as early as possible, and which I will send to you.

Jablochkoff's system, on the other hand, consists only in the burner, in which two rods of carbon burn away, side by side; each light—or "candle" as it is called—lasting 1½ hours. Four such candles are mounted on a simple connection in the lantern or opal globe, and provided with what electricians call a commutator, analogous to a set of valves in gas, by which the current can be sent to any candle at will, and so the light can be maintained for six hours. With this candle any suitable form of electric generator can be employed, the Gramme machine being actually used.

Railway Stations.—At the station of the Western Railway, Lontin's system is in operation. Two lamps are placed at the principal entrance; and 5 lamps are ranged along the middle of the principal hall, where they replace 34 gas-burners, and will no doubt do so to great advantage as far as effect is concerned, for the hall is so large that the gas employed has little power over it. These lights were not in operation when I left Paris, the engine not being ready. The goods department is, however, lighted by six naked burners, worked by one machine and steam-engine, the whole working of which I carefully examined. The result is very effective, as the men, loading and unloading, can easily see the addresses on the packages, and the light being distributed around the area of operations (which is, however, a small one), the work is done readily and safely.

Hotels and Shops.—In the large buildings opposite the Louvre, which include a great hotel and an immense series of show-rooms, forming the "Magasins du Louvre," a number of electric lights are employed, which contain (as do all the others I shall notice) the Jablochkoff candle. In the courtyard of the hotel, which is roofed in, there are—one lamp in the entrance, which also receives light from one in a window of a show-room; two lamps on one side of the courtyard; and six globes distributed over the staircase which forms the other side of the yard. These lights here replace 14 two-light gas-lamps, and 24 single globes upon the staircase.

In this instance I propose to make here some remarks upon the question of cost. It is stated that, including the show-rooms, 201 gas-burners, costing 90·4 frs. per day, have been replaced by 16 electric lights, costing only 63·6 frs. per day, being an economy of 30 per cent., with 3½ times the light. Whether in this calculation any charge is made for steam power, depreciation, or interest on outlay, I do not know, but I understand that the work is done by a previously-existing engine. It must, however, be remembered that the Paris gas costs twice as much as London gas, and is of lower illuminating power. Correcting the figures, therefore, in London, the cost would be 35 per cent. greater than the gas; besides which, the cost of the apparatus and working would be heavier, and so increase this per centage.

The Streets.—The light is used in many places, but I shall speak only of the Place and Avenue de l'Opéra, which form a roadway some 900 yards long by 30 wide, offering, from the present aspect, one of the most interesting sights of Paris. In front of the Opera there are two columns, carrying each three globes. In the Place there are four columns, each carrying a lantern in which two candles burn together. In the Avenue there are 36 globes, irregularly distributed. In the square of the Théâtre Français there are two circles of six globes, and two single ones. There are thus, in this one view, 64 electric lights, and, as may be supposed, such a sight is not a little striking, considered simply as a sight. Besides this, there are innumerable shop lights, and although by the effect of contrast the gaslights seem to be nearly extinguished, or swallowed up, by the electric light, they none the less contribute their due share of illumination.

When the beautiful total effect is analyzed, however, we find some things which will somewhat surprise both the casual observer, who goes away exclaiming that such a light must be introduced everywhere, and those who think only of the vivid character of the electric light itself.

It will naturally be supposed that two electric lights, placed only 40 yards apart, will illuminate perfectly the intervening space; on the contrary, a distinct gradation of light, approaching to comparative shade, is observable on the roadway, just as with gaslights.

People talk about the electric light in the streets superseding the shop lights as daylight does. On the contrary, not one single shop light has been put out. I spoke to one jeweller (besides several other shopkeepers) whose front was directly facing an electric lamp, five yards distant. He still used the ordinary outside lights, and, when I asked him if he found the electric light of use to his shop, he replied, with the usual French shrug, "Why, sir, it is simply moonlight." This is, in fact, the exact description of the effect; the lighting of the street is that of a moderate moonlight, unequally distributed, and the eye is caught by points of greater brilliance.

The light is fluctuating. Each candle is continually flashing and changing at times to a rosy tint. This would not be noticed by a casual observer, being lost in the general impression, but, on testing the effect by writing directly under a lamp, the light varied to, I consider, fully one-fourth of its maximum power.

The light is rapidly lost in the distance. There is a row of lamps in front of the House of the Legislative Assembly, which lights up the *façade* very effectively. In the Place de la Concorde these lights stand out vividly from the surrounding gas-lamps. At the front of the Madeleine, double the distance, they were distinguishable from these gaslights only by their greater whiteness, the Paris gas being very yellow. This observation will, no doubt, seem incredible to many; but I have made some calculations which prove that my sight and judgment told me the actual truth.

The Theatres.—The Hippodrome, a very large circus, is now lighted up with the Jablochkoff candles. There are 20 globes on the boundary line of the arena and the audience; between these there are also columns carrying three gas-globes turned towards the seats; above, there are 16 naked lights with reflectors, throwing the light on the middle of the arena. There are thus 36 electric lights in full action, and in addition there are four naked lights suspended from the roof, and employed during the trapèze performances. But with all these powerful lights the result was poor compared with the rich radiance we are accustomed to in theatres. As in the streets, it was an effect similar to moonlight, and the fluctuations in the lights were very perceptible. I was greatly surprised at this, as I was prepared to find the light especially suited to this purpose. I can only explain the actual fact by supposing that the eyes are dazzled by the number of cross-lights, directly influencing them, instead of illuminating principally the objects intended to be seen.

II.—*The Cost of the Light.*

As to this, it is impossible to obtain any real definite information. We can only take at a suitable discount the statements of the interested parties. It would be useless to describe the machines for converting mechanical energy into electricity and light, but they are costly.

The price of the Gramme machines used with the Jablochkoff candles at present is £400 for the size working 16 candles; the fittings of each lamp cost £8, and the two conductors together 3s. 6d. per yard of distance. The expenses of fitting up are to be added, and the prices, being at Paris, would be a good deal higher here. Besides all these, an engine of at least 20-horse power must be provided.

The hourly cost of working is stated at 8s. 8d. per machine, or 6½d. per light, to which must be added an allowance for depreciation, repairs, and interest.

Making the very best of it, the expense cannot be less than 8d. per hour per light; but any calculation based on this, without taking into consideration the circumstances of any particular case, would be so vague that I shall confine myself to the one distinct statement agreed to by all the interested parties—that each single light consumes one-horse power of an engine besides all the incidental expenses.

In the Lontin system, I believe that the first cost is less, and also the working expenses, to some extent. But I know that the light exhibited at the Gaiety tries to the utmost the power of a 12-horse engine.

The light produced is stated at 100 Carcel lamps for regulators, and 80 for candles. There is some doubt about the value of the Carcel lamp in our standard candles; but Mr. Sugg values it at 9·5, and I will use this value as being the highest.

This gives us 950 candles for the one, and 760 for the other light, both naked. I greatly doubt this value. I found no difficulty in steadily examining the lights at a distance of 12 or 15 feet, and cannot believe that my eyes would endure the light of 760 candles gathered into a point no larger than a sixpence.

The lights are actually used in opal glass globes, which are said to absorb one-third of the light. The best experiments, I believe, show that—

Plain glass absorbs	. . . . .	10 per cent.
Ground „	. . . . .	30 „
Opal „	. . . . .	60 „

This would give the actual light (taking their own value for the candle itself) as 300 standard candles.

Ordinary gas, properly burnt, will give at least the light of 14 candles for 5 feet per hour—that is to say, 1000 feet give, for one hour, a light of 2800 candles, at a cost of say 3s. 4d.

Assuming that the electric candle gives the 300 candles, and that its cost per hour is only 8d., the cost of the same 2800 candles is 6s. 2½d.—that is to say, that, for equal quantities of light, the electric candle costs, on the figures of the interested parties, nearly twice as much as gas does; and to attain this result, all the trouble and risk of machines and engines must be incurred, as compared with the simple turning on a tap.

On the other hand, the electric light has well-known advantages; and, further, these figures are but approximate values for results already attained, while it cannot be doubted that greater improvements will be made. In fact, I am cognizant of, and have seen in operation, a machine very much simpler and less costly than those now used, and which, as far as I can judge, will take considerably less power to work it. But the same remark applies to gas, for there is wide room for improvement in the burners and fittings to enable the gas to do its work. One of the effects of the excitement about the electric light will be to stimulate endeavours in this direction.

III.—*Influence on Gas Interests.*

Turning now to the influence likely to be exerted upon gas interests, it is very evident that the electric light has a place to fill, in which it has advantages over gas, and in which it must be expected to gradually replace it. But it is also evident that such uses are limited by the cost of working, by the large outlay involved, and by the specific nature of the light.

We cannot limit the inventive faculty, but there is little probability that the electric light will be adapted to domestic uses. For street lighting, some very great advances must be made in the direction of economy beyond what is yet done before there is much chance of seeing electric lights used, except possibly in a few crowded crossings, such as Charing Cross or Oxford Circus. The case is not to be compared with Paris, where, as before stated, the relations of cost are also very different. Paris is a great fair or bazaar, and the people live in the streets, which are filled with beautiful buildings and manifold sources of attraction. Abundant light is as much a part of their stock-in-trade as it is in our public-houses, and it pays them to disregard its cost. Neither our climate, cities, nor habits of life are the same, nor do they offer us inducements to adopt the same course as would suit Paris, where the gas lighting is so profuse that, in the Rue de la Paix, for instance, the lights are equivalent to one good burner every 4½ yards. The illumination there, if not so vivid, is, practically, quite as useful as the electric light in the adjoining Avenue, in which an exactly similar system of lights was, and still is, used after midnight.

In railway stations, large halls, and in manufactories, the light will no doubt be used, but its introduction will be gradual, and its utmost effect will be to reduce the annual increase of consumption of gas; it is not likely to touch the actual consumption by which dividends are earned.

On the other hand, there is a nearly new field opening for gas in the form of gas-engines. These are receiving great improvements, and from their safety and convenience, and from the fact that they require scarcely any attendance, are destined to replace steam-engines to a great extent. In fact, should the electric light come into much use, it is most likely that gas will be called upon in very many cases to supply the motive power. There are also other undeveloped uses for gas which will compensate for any amount of reduced consumption at all likely to result from the electric lighting.

Finally. It needs no prophetic power to foresee that ere long a dead set will be made in the market, both upon gas shares and upon the pockets of the British public, the natural prey of the "promoter." Many timid shareholders will sell, as always happens under similar circumstances, and it is highly probable that shares will suffer for a time a reduction in price.

But I feel no hesitation in expressing the conviction, after full examination of the subject, that the Gas Companies of London have nothing whatever to fear, and that whatever may happen to gas shares, owing to market operations, gas dividends will not suffer the reduction of a shilling by any competition with the electric light.—I am, &c.,

JOHN T. SPRAGUE,
Member of the Society of Telegraphic Engineers.

THE LOWE-STRONG WATER GAS PROCESS.

At the Meeting of the Iron and Steel Institute, last month, in Paris, a paper, of which the following is an abstract, was to have been read by Mr. R. P. Rothwell, of New York, on the above subject, but time did not permit of this being done.

The author stated that the object of the paper was to bring before the members of the Institute the progress that has been made, during the past few years in America, by Messrs. Lowe and Strong, in the great problem of the economical production of fuel. By their process steam is converted into gas by being turned into a chamber half filled with intensely burning anthracite. When the object is to make illuminating gas, there is simultaneously fed into the top of the generator a certain amount of crude petroleum of ordinary density, which, vaporized by the heat as it enters, is swept on to, and through a superheater, in which it undergoes gasifaction; and the whole mixture passes to the washer, and to the other arrangements provided for condensation.

The amount of gas obtained at each heat is 3000 cubic feet or more, according to the degree of heat attained; and the average time of each such heat, including both stages of blowing up the fire and generating the gas, is one hour; so that 24 heats, or over 70,000 cubic feet of gas, can be obtained daily from each apparatus. Gas of an illuminating power of 19·5 candles was obtained, using 64·63 lbs. of coal per 1000 feet of gas. In addition to this, 3·15 gallons of crude petroleum were used per 1000 feet of gas. The cost of labour and purification were but 2·78 cents per 1000 feet. The gas is a mixture of hydrogen and carbonic oxide, and it is claimed for the Lowe process that the carbonic acid is reduced to 3½ per cent., that the quality is uniform, that the gas tar produced is but one-fourth that from gas coal, and that the sulphur is but one-third, and the ammonia one-fifth that in coal gas. The current cost of 19½-candle gas, delivered into the holder, involves a saving of at least 35 per cent. over that of gas from gas coal of a much inferior quality.

Mr. Lowe's works were small, and have for more than four years ensuing supplied the town of Phœnixville, Pa., continuously and satisfactorily. The first success of the apparatus upon a large scale was at Utica. The process has been lighting Indianapolis during the past six months. The most extensive and complete works, however, are at Baltimore, built during 1877 expressly for this process, with 55 miles of new and exceptionally large mains, and a generating capacity at present of a million feet, capable of duplication.

A modification of this process has, however, been devised by Mr. M. H. Strong, who uses anthracite fine coal (waste), gas coke, lignite, peat, or indeed almost any kind of carbonaceous fuel. When the steam is admitted and intensely heated by contact with the bricks, it meets at the top of the generator a shower of coal-dust sifted downward from a hopper. The steam has acquired such an increment of heat that, by contact with the dust-carbon, a mutual decomposition instantly ensues, and the gases resulting pass downward through the bed of coal and out below the grate-bars into a hydraulic main.

The operations of the apparatus at Mount Vernon, in New York, prove that a pure water gas can be obtained by the expenditure of not over 2240 lbs. of coal for each 50,000 cubic feet. The ability of this system to utilize dust-carbon has been tested even to the successful use of peat, as already mentioned. The cost of the gas is from 6 to 8 cents per 1000 cubic feet.

The special advantages of the Strong gas for use in metallurgy are, apart from the question of economy, the high and easily regulated temperature it affords, and the relatively small volume of products of combustion compared with the heating effect. It is, in fact, the most concentrated form of gaseous fuel hitherto attainable.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

As I anticipated in my last report, the upward movement in the price of round coal in the Manchester market has not been followed in any other district, whilst even so far as Manchester is concerned, the advance has only been partial, and apart from the retail price of house coal to private consumers, it is doubtful whether higher prices can be maintained. With the exception of the extra demand for house coal, which it is only natural to expect at this season of the year, there is no improvement in the coal trade of Lancashire, the requirements for all descriptions of fuel for manufacturing purposes continuing extremely small, and consumers being able to secure supplies at quite as low prices as ever—slack, in consequence of the increased quantity now coming into the market, being, if anything, easier. The general quotations at the pit mouth show no material change. At one or two collieries best Wigan Arley is quoted at 10s. per ton, but good ordinary qualities can be readily bought at from 9s. to 9s. 6d., common sorts at from 7s. to 7s. 6d. per ton, and Pemberton four-feet at from 6s. 6d. to 7s. 6d. per ton. Common coal, which is still a great drag, owing to the depression in the iron trade, is very irregular in price, and where sales are pushed very low prices have to be taken. The average quotations range from 5s. to 6s. per ton. Good burgy is sold at from 4s. to 4s. 6d., and good slack at from 3s. 3d. to 3s. 9d. per ton.

For shipping rather more inquiry is reported; but the amount of business doing in this branch of trade is still very small, and to effect sales extremely low prices have to be quoted.

The Glasgow Bank failure has caused some excitement in this district; but although a considerable amount of business is done in Scotch warrants here, no serious results are anticipated, so far as the iron trade of the district is concerned. The business doing in local pig iron continues very small, for although Lancashire makers are not unwilling to give way slightly, they are still undersold by some of the outside brands, which can be bought at lower prices than have been known for years past. Finished iron is without material change, Lancashire bars delivered into the Manchester district being quoted at about £6 per ton; but orders are very scarce.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

A few more sailing vessels reached the northern ports last week; but as orders were in the market, they were chartered at an advance of something like 10s. per keel to the Channel ports, and about 3d. per ton to London. London rates for steamers have been 4s. 3d. per ton, sailing ships, 5s. 3d.; Rochester, steamers, 4s. 4½d. per ton; France about £7 5s. per keel. All the best collieries in the gas coal trade have been fully employed over the last fortnight's pay. Shipping turns are from five to six colliery working days. Prices of best gas coals are 7s. per ton, net, and second-class gas coals 6s. per ton, less 2½ discount; but for second-class coals the demand is not so strong as for best. Best steam and household coals are more inquired after, but there is no change in prices.

Though the manufacturing trades of the Tyne and the North of England generally have had to sustain the effects of a reaction of business, consequent upon the stoppage of the Glasgow City Bank, there has been little depression and no panic. In fact the chemical market was slightly firmer on Saturday. In the lead market, on the Tyne, pig sold at £16 10s. per ton; dry white lead, £22 10s.; red lead, £17 10s.; flake litharge, £18 10s.; copper, flat cake and ingot, £66 to £68; best selected, £72 per ton.

The demand for labour is beginning to go off in the North. The import trade is almost poorer than the export, and men are beginning to fall out of employment, through a scarcity of work in various parts of the Tyne. Seamen are doing very badly. In all recent strikes amongst workmen (as, for instance, the strike of the North Shields joiners, which lasted twelve weeks) the men have had to give way, and accept the masters terms.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

At the Monthly Meeting of the Dumfries Corporation Gas Commissioners, held last Thursday, one of the members referred to complaints that had been made as to the quality of the gas, to which Mr. Paterson replied that he was not aware of there being any cause for complaint with regard to the luminosity of the gas. If there was anything wrong at all, it was a slight want of pressure. Mr. Rae, one of the Commissioners, had complained that the pressure was insufficient for his business, but the Committee came to the conclusion that it was impossible to supply individual members with an extra pressure for their business purposes. If that was required, it was the duty of the parties to provide a gasholder for themselves, and regulate their own pressure. I find that Bailie Wood, who lately resigned the Convenership of the Gas Committee, is still carrying on the duties of Gas Examiner for the burgh. His last report, just issued, is for the month of September, and in it he says that the average illuminating power for the month was 25·50 standard candles, which is certainly very much better than it used to be according to his reports issued prior to the gas supply being taken over by the Town Council.

The Directors of the Tain Gas Company have resolved to reduce the

price of gas from 12s. 6d. to 10s. 10d. per 1000 cubic feet—a reduction equivalent to a dividend of 5 per cent. on the capital of the Company.

At a special meeting of the Inverness Police Commissioners, held last Monday, it was resolved, in accordance with a recommendation of the Water and Gas Committee, to increase the domestic water-rate from 10d. to 1s. per £1 of rental. It seems that when it was resolved to reduce the rate, last year, to 10d. per £1, certain liabilities that should be provided for were altogether overlooked. This circumstance does not reflect very creditably upon the "powers that be;" still, it must be said on their behalf that since they obtained their Gas and Water Act they have managed their gas affairs somewhat better.

A special meeting of the Burgh of Lockerbie Police Commissioners was held last week, at which it was resolved that the Burghs Gas Supply (Scotland) Act should be adopted and applied to the burgh.

The Forfar Corporation Gas Commissioners have resolved, in consideration of the present condition of the finances, not to purchase a number of gas annuities that had been offered to them.

At the quarterly meeting of the Ayr Harbour Trustees, held last Monday, orders were given for the erection of 18 gas-lamps round the new wet dock; and it was remitted to the Standing Committee to consider a communication from the Newton Gas Company (north side of the River Ayr) offering to supply the harbour with gas at the ordinary rate, and lay the pipes at their own expense, on condition that the Trustees should give the Company a guarantee that they would use the gas for not less than twelve years. The Secretary remarked that he supposed the latter condition was on account of the electric light. The Provost suggested the feasibility of utilizing the hydraulic engine for the production of the electric light for the dock. He seems to be very anxious to supersede the use of gas.

The Corporation Gas Committee reported to the Town Council of Hamilton, at the monthly meeting held last Thursday, that the illuminating power of the gas was 29·1 standard candles, and that the cost was 1s. 2½d. per 1000 cubic feet for wages and management. The new works have progressed so far that it is intended to use the large holder for storeage purposes in a few days.

Progress is being made with the proposed scheme for providing a good water supply for the thriving town of Lochgelly, in Fifeshire. Some days ago, a large number of intending contractors, accompanied by Mr. Sang, C.E., Kirkcaldy, and the Provost and several of the Police Commissioners, went over the line of the pipe track, and examined the site of the intake dam, filter, &c. Lochornie Burn, which is the source of the proposed supply, was found, on being gauged, to yield nearly 1½ million gallons of water every 24 hours, or 25 times more than the full supply to be provided—namely, 60,000 gallons per day.

The extension of the Paisley Water-Works, by the addition of a fourth large reservoir, having for some time been a settled question, the preliminary steps for the practical issue of the scheme are being taken with all convenient despatch; the recent drought, with its curtailed water supply, having scared the Municipal Authorities into more prompt action than would otherwise have been considered necessary. The site chosen for the new reservoir is on ground made classic by the poet Tannahill. Its superficial area will be about 38 acres, and it is calculated that the increased storeage thus about to be provided will be equal to one month's supply of the whole town. The Duke of Abercorn is the proprietor of nearly all the ground required for the new reservoir.

On the 24th ult. it was reported that the delivery of water into the city of Edinburgh was at the rate of 28·03 gallons per head per day to a population of 282,500. The quantity of water stored in the five reservoirs belonging to the Edinburgh and District Water Trust was, on the same date, 346,001,393 gallons, as against 365,898,393 gallons on the 10th of August, and 685,242,152 gallons on the corresponding date of last year. The rainfall at Glencorse, from the 1st of January till the 24th of September of the last three years, was as follows:—1876, 30·00 inches; 1877, 43·60 inches; 1878, 25·60 inches.

It has been resolved to wind up the Water of Leith Sewerage Commission, and to have a clause introduced into the new Municipal and Police Bill of the Edinburgh Town Council, giving the necessary powers to do so and to form the drainage of the city into one district.

The Municipal Authorities of Glasgow are at present engaged in the consideration of a scheme, which is to be embodied in a Bill for next session, for dealing with the purification of the Clyde. In company of the Lord Provost and other persons connected with the government of the city, Mr. Hill, C.E. (Bateman and Hill), London, lately made a minute inspection of the district, through which it is proposed to run a great main sewer, so as to reach a large tract of land which was acquired at Dalmuir, some time ago, for the purpose of treating the sewage before allowing the effluent to fall into the Clyde.

In consequence of the failure of the City of Glasgow Bank, the pig iron market has been in a very depressed condition since last Wednesday, when the announcement was first made. No market was held that day, and on Thursday, in a very excited market, large quantities of pig iron changed hands at from 44s. 6d. down to 43s. 6d., the closing price being 44s. Friday's market was also excited, and the prices ranged between 43s. 10d. and 44s. 6d. cash, closing in the afternoon for buyers at the higher quotation. The last time when Scotch pig iron sold at 44s. was in Aug., 1852.

No change falls to be recorded in regard to the coal trade, unless it is that miners wages are again being reduced all round, from 7½ to 10 per cent.

Sale of Gas Stock at Fareham.—On the 23rd ult., £426 of stock in the Fareham Gas and Coke Company was sold by auction for £530, thus realizing a premium of nearly 25 per cent.

New Company Registered.—On the 20th ult., a Company entitled the Quaker's Yard Gas and Water Company was registered, with a capital of £15,000 in £10 shares, for the purpose of supplying gas and water to Quaker's Yard, Treharris, Llancaiach and Bedlinog, in the county of Glamorgan.

Blackpool Gas Supply.—At a meeting of the Blackpool Town Council last Tuesday, the report of the Gas Committee, which was confirmed, recommended that extended powers be obtained to fix the price of gas at 4s. 6d. per 1000 feet, to cut off gas and recover accounts in a summary manner, and to raise additional capital to the extent of £35,000.

Water Supply of Limerick.—The Limerick Town Council, at their meeting last Thursday, unanimously decided on serving legal notice on the Water-Works Company to appoint an Arbitrator to treat for the purchase of their property by the Corporation under the Public Health (Ireland) Act, 1878, with the view of supplying the citizens with an adequate supply of pure water at a reasonable price.

Presentation to Mr. W. Fergusson, of Sheffield.—Last Wednesday evening a very valuable gold lever stop-watch and massive gold Albert chain were presented, as a mark of the esteem of the officers and workmen at the Neepsend station of the Sheffield United Gas Company, to Mr. W. Fergusson, on his leaving the service of the Company. This presentation is all the more gratifying to Mr. Fergusson and his friends from the comparatively short time—2½ years—that he has been in Sheffield.

Accident at the Worksop Gas-Works.—A shocking accident occurred at the Worksop Gas-Works on Monday, the 30th ult. The foreman-stoker (Edward Race) was oiling the ammoniacal liquor pump while the engine was running. The rigger caught the man's shirt-sleeve, and drew his left arm between the wheels, breaking it into splinters, and stripping off the flesh. Had not Mr. Bates, the Manager of the works, been near at the time, and, hearing the man's cries, stopped the engine, he would have been completely drawn through. Race was at once conveyed to the dispensary, and the arm was cut off above the elbow. He is at present in a very low state through loss of blood and the severe shock, but hopes are entertained of his recovery.

Birmingham Corporation Water Supply.—Last Friday a meeting of the ratepayers of Birmingham was held, in accordance with the provisions of the Borough Funds Act, to consider a resolution passed by the Town Council at their meeting on Tuesday, Aug. 6, to apply to Parliament next session for power to borrow £300,000 for the purposes of the water-works undertaking. The Chairman of the Water-Works Committee (Alderman Avery) moved—"That the Council of this borough be authorized and empowered to make an application to Parliament for an Act to extend the time, limited by the Birmingham Water-Works Act, 1870, for the construction of the works by the said Act authorized, for a further period of five years; and to empower the Mayor, Aldermen, and Burgesses of this borough to borrow a further sum of £300,000 for the purposes of the Birmingham (Corporation) Water Act, 1875, and the undertaking transferred to, and invested in, the Corporation by virtue of the said Act; and for other purposes." After fully explaining the need for this application to Parliament, which was shown in the debate reported in the Journal of the 13th of August last, page 244, the motion was seconded by Alderman Baker, and carried with but four dissentients.

North of England Gas Managers Association.—A most successful meeting of this Association was held at the Town Hall, Carlisle, on Saturday last, under the presidency of Mr. John Hepworth, when, after an interesting address by the President, papers were read "On Tank Trammels," by Mr. W. Ford; "On the Advantages to Gas Companies of carrying on the Business of Gas-Fitters," by Mr. C. Sellers; and "On the Relation between the Sulphur Tests of Wright, Letheby, and the London Gas Referees," by Mr. John Pattinson, F.C.S. It was agreed that two prizes of books be given, one of £3 3s. and the other of £2 2s., for the two best papers produced during the year; and that, in view of the projected meeting of the British Association of Gas Managers at Newcastle-upon-Tyne, in June next, the President, Vice-President, and Committee of the Association be a Committee to make arrangements for their reception. The Mayor of Carlisle was present during the meeting, and gave the Association a hearty welcome to the city. After the business was over he entertained the whole of the Members and Associates at dinner at the Bush Inn, when a pleasant evening was passed. We shall give a full report of the proceedings in our next issue.

Register of New Patents.

3143.—Thompson, W. P., Liverpool, "*Improvements in and appertaining to ball or spherical valves.*" A communication. Patent dated Aug. 18, 1877.

This invention consists in providing the valve case or body in rear of the valve-seat or throat with a diverging channel, into which the valve passes when it leaves the seat, and through which the reflux water passes against the ball to drive it to its seat. The construction and arrangement of parts is such that when the ball is back the water is allowed a direct unobstructed passage, and that when the water commences a reverse movement it closes the valve.

3159.—Johnson, J. H., Lincoln's Inn Fields, London, "*Improvements in effecting the conversion of hydrocarbons and other combustible liquids into gas, and in apparatus or means employed therein, and in or for the production and application of gaseous mixtures.*" A communication. Patent datent Aug. 20, 1877.

In carrying out this invention, the combustible liquid or hydrocarbon to be converted into gas is introduced in uniformly equal quantities into the upper part of an extremely shallow box or receptacle, which, on account of its functions, is termed a spreader. The volume of the quantities is capable of being varied at will, according to the quantity of the gas to be produced, or the purpose to which it is to be applied; but when once the adjustment is made it should remain permanent.

The box or spreader, the other dimensions of which may be varied as required, is always made extremely shallow. This peculiarity constitutes a most important feature, and is an indispensable condition. It is usually made from about 1-25th to 1-8th of an inch in depth, and rarely exceeds 1-4th of an inch. The box or spreader is placed either in an inclined position or vertically, whereby the liquid introduced at the upper part, or about midway, is caused to descend along one of the sides, on which it is distributed in a very thin sheet or film. The external air enters at the lower part of this box through apertures provided for the purpose, such air being drawn in by the vacuum produced by the consumption of the gas. By opening or closing a certain number of these apertures, the exact volume of air to be introduced into the box is regulated as required. This volume should be in proportion to that of the liquid, according to the nature of the gas which it is desired to produce. The apparatus should be adjusted by experiment, when used for the first time; this operation requires, however, only a few minutes.

In this arrangement of the apparatus the air passes through the box in an opposite direction to that of the descending stream of hydrocarbon, and forms, by reason of the extreme shallowness of the vessel, a very thin sheet, in such a manner that the whole of its molecules are brought into intimate contact with the whole of those of the film of hydrocarbon, which are vaporized and carried off in the form of vapour or gas. An intimate mixture is thus produced, which contains a uniform proportion of hydrocarbon and air, being formed by uniformly proportionate quantities of these two bodies, for as the volume of hydrocarbon introduced into the box or spreader (its flow being regulated by suitable appliances) is proportionate to, or measured by, time, and as the volume of air is regulated in a similar manner, the proportion of the constituent parts of the mixture formed by these two elements is necessarily uniform.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

2063.—Goldsmith, G., and Dilkes, J., "Improvements in apparatus for heating by gas." Aug. 4, 1871.

2446.—Peebles, D. B., "Improvements in gas-regulators." Sept. 16, 1871.

2495.—Banks, J., and Walker, W., "An improved system for the treatment of sewage, parts of which are applicable to the filtration of water for the use of towns, and other liquids on an extensive scale, and apparatus therefor." Sept. 22, 1871.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, and TWO MEDALS at the PHILADELPHIA EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS;
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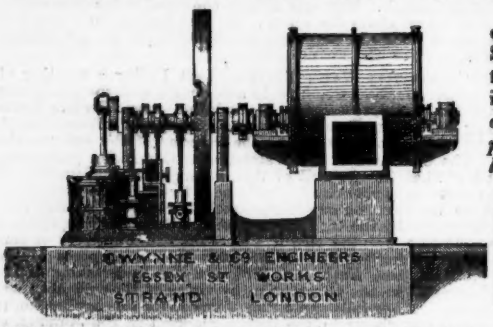

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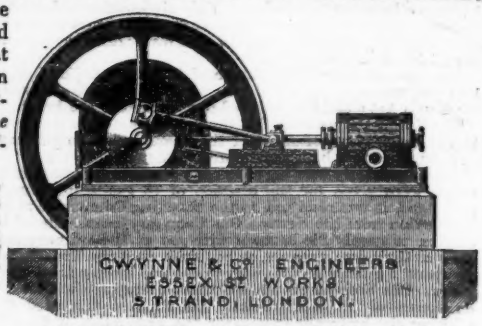

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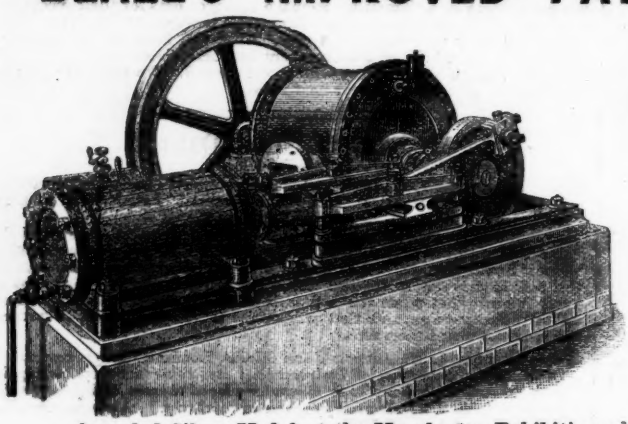

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Suitable ground for the erection of Chemical Works may be acquired in the immediate neighbourhood of the Gas-Works.
The Corporation do not bind themselves to accept the highest or any tender.
J. D. MARWICK, Town Clerk.
City Chambers, Glasgow, Sept. 3, 1878.

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WILLIAM DAVIS, Engineer and Manager.
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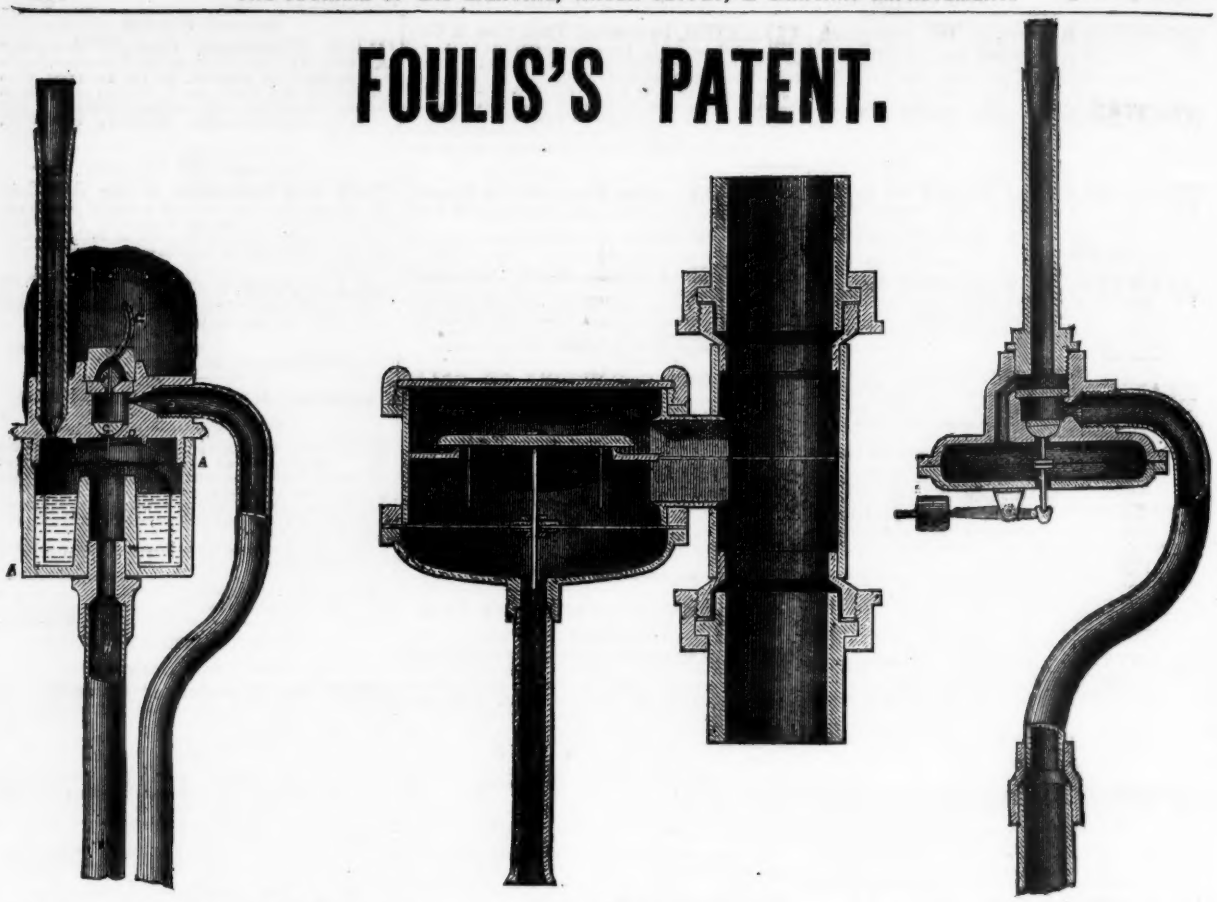

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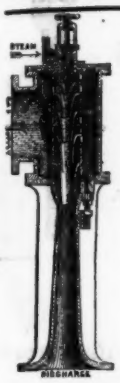

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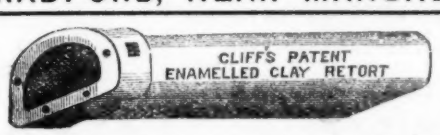
Established 

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T. Stone, Esq., of Weymouth, writes on Nov. 17, 1876: "I have used about 12,000 tons of this Coal, with, I think, the best possible results, although not always under the most favourable circumstances. My Coal account made up to Midsummer last showed a makeage of 10,524 cubic feet per ton of 14½-candle gas, and not a hundredweight of Cannel used. This statement would, I know, be incredible to many men, and may provoke the remark, 'How much of it is paid for?' For the gratification of such, I have to say that, of the above quantity, 9866 cubic feet per ton of Coal carbonized were brought to charge and duly paid for, with the exception of about 6s. per cent. for bad debts. The coke is of excellent quality. The above facts I hold to be a greater recommendation to your Coal than any words of mine could be."

PRICES ON APPLICATION, EITHER F.O.B. OR BY RAIL IN TRUCK LOADS.

THE TYNE COAL COMPANY, LIMITED, OWNERS.
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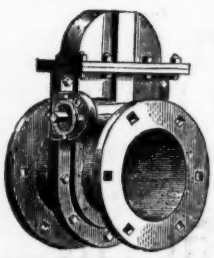
WITH WROUGHT-IRON PINIONS.



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These Valves are proved on both sides to 30 lbs. on the square inch befor leaving the works, and are kept in stock.

In ordering Valves, please state whether required for under or above ground, and if to be with flanges or spigots and sockets cast on, or with separate spigot and socket pieces.

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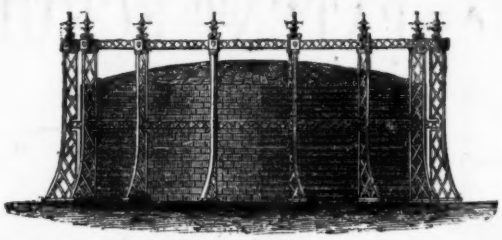

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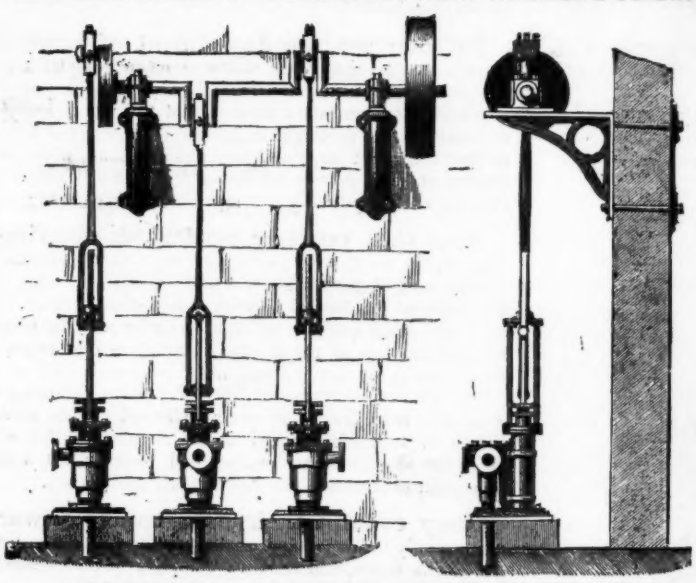

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This illustration shows an arrangement of three (No. 179) Improved Double-Action Pumps driven from the same crank-shaft, as frequently supplied for use in Gas and Chemical Works. The suction and discharge pipes can be arranged for drawing from and delivering in any required direction.

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Keep in London and at their works large stocks of PIPES and CONNEXIONS (1½ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

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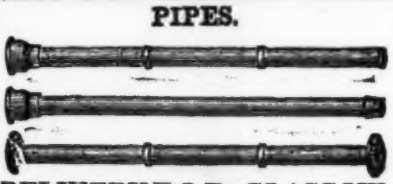

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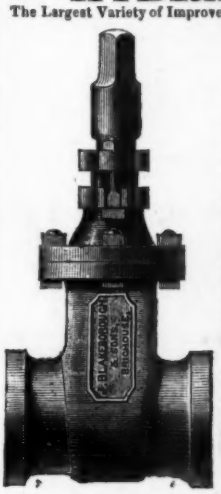

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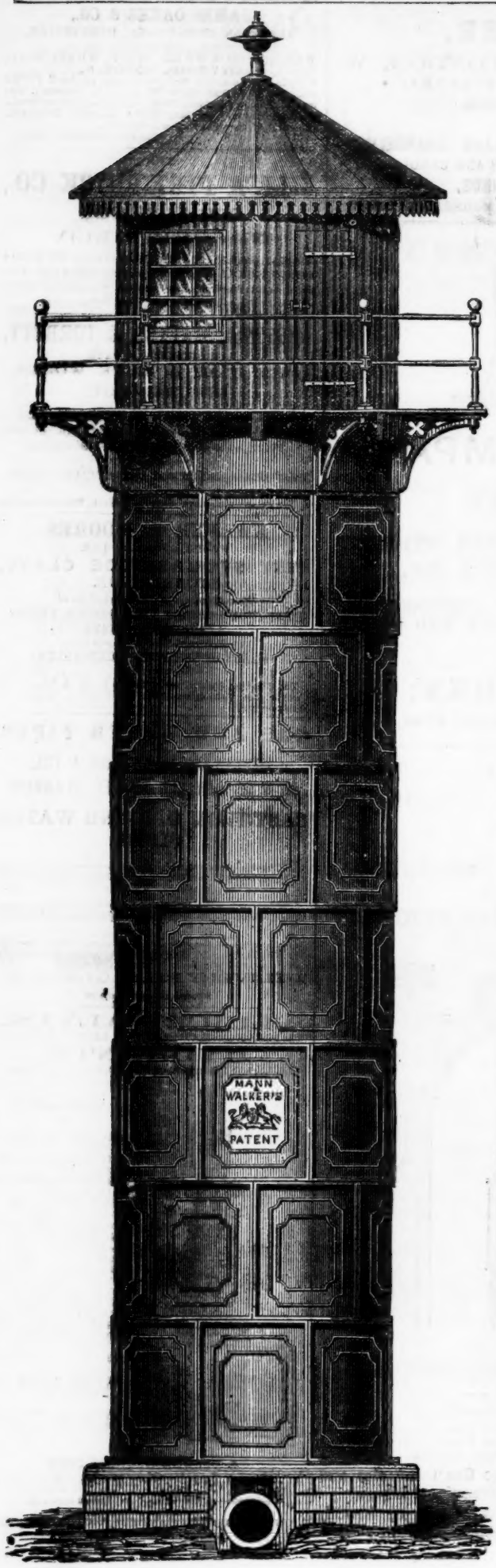

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MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

Fifty million cubic feet of gas per 24 hours are purified from ammonia by these Patent Scrubbers in a winter's day in the gas-works of London, where the purity of gas supply is the highest in the world, under the chemical restrictions of the Board of Trade.

Generally, wherever a high standard of purification is maintained in the chief cities and towns of the British Provinces and of Europe, these Scrubbers have become established.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours or a winter's day, and the smallest make on a summer's day, to be purified.

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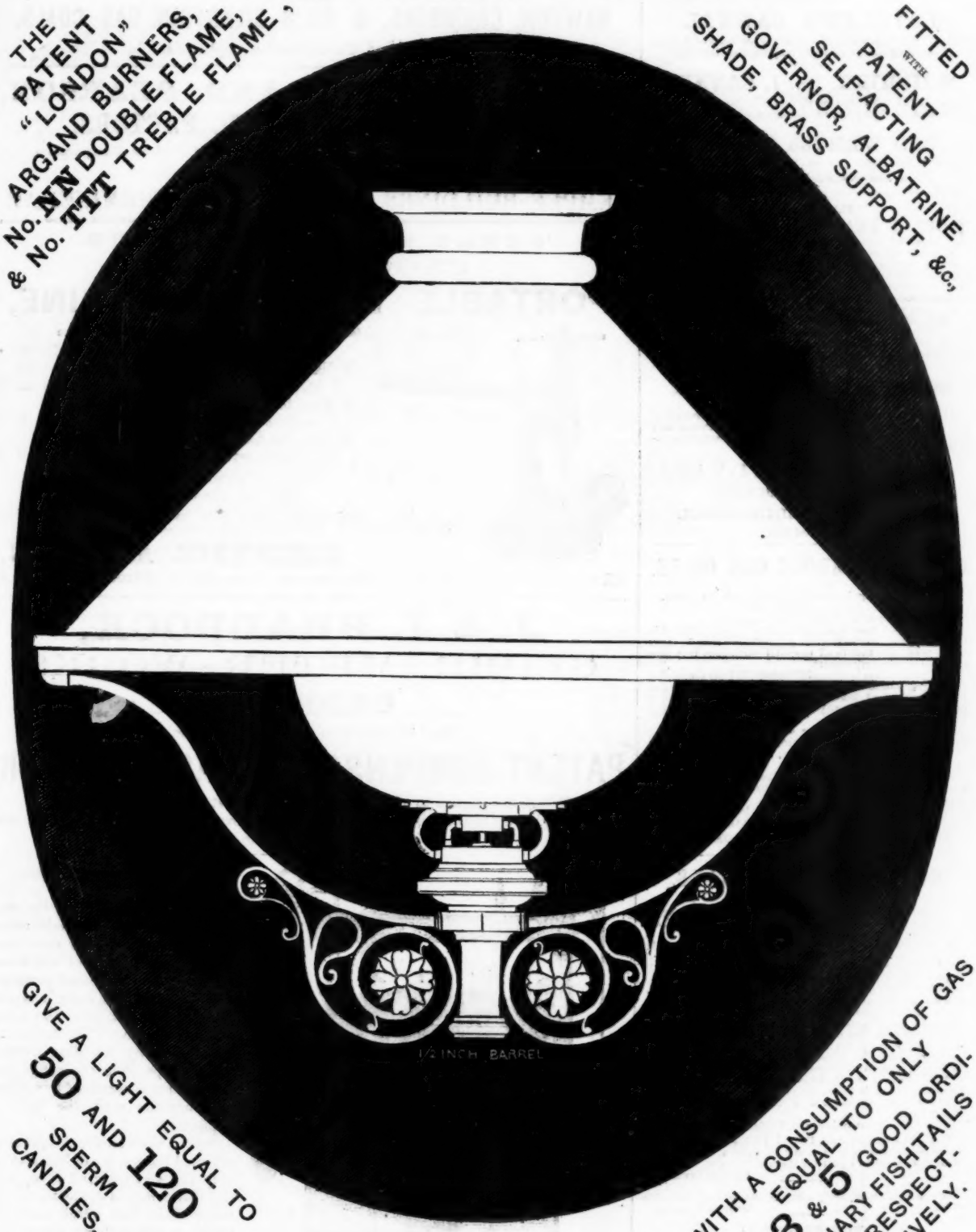
NEAREST APPROACH TO DAYLIGHT.

THE PATENT "LONDON" ARGAND BURNERS, No. **NN** DOUBLE FLAME, & No. **TTT** TREBLE FLAME,

FITTED WITH PATENT SELF-ACTING GOVERNOR, ALBATRINE SHADE, BRASS SUPPORT, &c.,



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PILLAR LIGHT, fitted with either No. NN or TTT Patent "London" Argand Burner,

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Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

MUIRKIRK, No. 1, CANNEL

Yields 13,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

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Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full Analyses on application.

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POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over 10,000 cubic feet of gas, with an illuminating power of 16 candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, LIMITED, West Riding and Silkstone Collieries, near LEEDS.

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The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.

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Established 1840.

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South Metropolitan Gaslight and Coke Company, London, July 12, 1878.

The Owners of the Dean's Primrose Colliery.

Dear Sirs,—I have much pleasure in stating that this Company have regularly used your Coals for more than thirty years, and that in all essential particulars they give the most satisfactory results.

The yield of Gas is from 9700 to 9800 feet per ton, of full 16 candles illuminating power, tested by the London Referees Standard Burner; and the Coke is of very good quality, while the quantity is about 40 bushels to the ton of Coal.

I consider Dean's Primrose Coals to rank amongst the first-class Gas Coals from the Durham Coal-Field.

Yours truly, GEORGE LIVESEY.

These Coals are also used by The Gaslight and Coke Company (London), and other English and Foreign Gas Companies.

Steamers loaded with quick despatch in the River Tyne. Price and other terms on application at the

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HOLMSIDE GAS COALS.

South Metropolitan Gaslight and Coke Company, 589, Old Kent Road, London, S.E., Oct. 9, 1873.

At the request of Mr. Hedley, the owner of the Holmside Colliery, I have much pleasure in stating that, for about ten or twelve years past, this Company has taken at least half of its supply of Newcastle Coal from him. I can, therefore, confidently bear testimony to the good quality of the Holmside Coals, and consider they are equal to the best of the Newcastle Coals, in proof of which I may state that this year we are using those Coals exclusively, that the yield of Gas is from 9700 to 9800 feet per ton, and that the quality of the Gas, without any admixture of Cannel, is over 16 candles, as tested by the officer appointed by the Metropolitan Board of Works, using the London Gas Referees test.

The Coke is of excellent quality, and in quantity amounts to about 40 bushels from a ton of Coal.

The annual consumption of Coal amounts to about 75,000 tons.

GEORGE LIVESEY, Engineer and Secretary.

P.S.—I am at this date, Feb. 15, 1875, still using Holmside Coals as largely as ever, and am quite as well pleased with them as when I gave the above certificate.

GEORGE LIVESEY.

We are this year, 1878, using 80,000 tons of Holmside Coal.

GEORGE LIVESEY.

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All negotiations respecting M. Brémond's patented process for preventing Deposits of

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in Gas Main and Service Pipes should be addressed to Mr. W. H. BENNETT, 22, Great George Street, WESTMINSTER, S.W., or to M. BREMOND, Gas Engineer, Compania Madrilena de Alumbrado y Calefaccion por Gas, MADRID, who may be consulted upon all matters connected with the Gas Industry.

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Drills, 1s. 6d. each.

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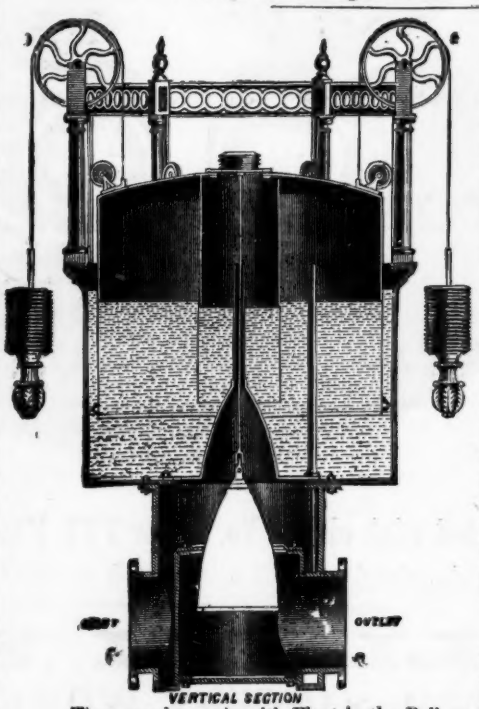
Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

THE SILKSTONE & DODWORTH COAL & IRON COMPANY, LIMITED,

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REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—
"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces **12,240** cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

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PLANT ERECTED ON THE LATEST AND MOST APPROVED PRINCIPLE.

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MANUFACTURERS OF EVERY DESCRIPTION OF

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CONTRACTORS FOR THE

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Plans and Specifications Prepared, and Illustrated Catalogues forwarded on application.

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CELEBRATED SILKSTONE GAS COALS.

The various descriptions of Gas Coal produced from the above Collieries possess an unequalled reputation, combining in a large degree the constituents essential for the production of the best quality of Coke and Gas of a high illuminating power.

A recent extensive development of the Collieries enables us to offer increased supplies.

JAS. PATERSON, Esq., of Warrington, after testing various qualities of our Coal, has sent the following testimony of their merits:—

"Warrington Gaslight and Coke Company,
Offices, Mersey Street, Warrington, April 23, 1877.

"MESSRS. NEWTON, CHAMBERS, AND CO.,

"GENTLEMEN,—After carefully testing the various samples of Gas Coals sent from your Collieries for analysis, I have pleasure in reporting them as belonging to the highest class of Gas and Coking Coals.

"The average of Nine samples gives a yield of **12,500** cubic feet of **15½**-Candle Gas, being equivalent to **664** lbs. of sperm per ton, and **1420** lbs. of fixed carbon of a very superior quality. All the samples bear a close relation to each other in value.

"Yours truly, "JAMES PATERSON."

Full particulars will be sent on application to us—address as above.

NEW PATENT WET GAS-METER,

THE "RELIANCE,"

MANUFACTURED BY THE

GAS-METER COMPANY, LIMITED,

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The object attained by this invention is the *correct measurement of Gas under every fluctuation of the pressure.*

Accuracy is obtained by subjecting the whole of the water which determines the measuring chambers of the drum to one uniform even pressure, and so prevents unequal displacements of the water-line.

The "RELIANCE" METER has been tested by several of the most experienced official meter inspectors. Copies of their reports may be obtained on application to the

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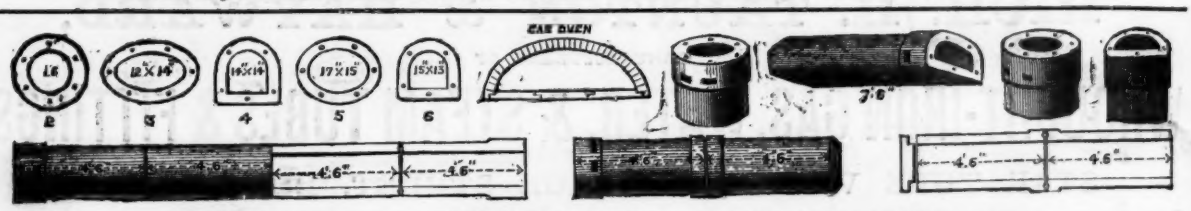

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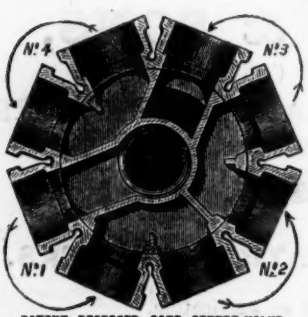

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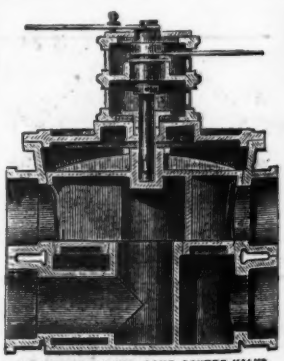

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